

# THE IRON AGE

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## A Manufacturing Plant General Store

The Cleveland Hardware Company's Effort  
to Reduce Its Employees' Living Cost—  
Full Line of Household Goods Carried

BY F. L. PRENTISS

The ability of a workman to live comfortably and to provide for his family properly in these days of high prices depends to a larger extent than ever before on the practising of domestic economies that will make a dollar go as far as possible. Shop employees, as a rule, are not in a position to purchase household provisions at an advantage but buy in small lots and frequently at prices that are high, considering the quality of the goods. For the purpose of improving the welfare of their workmen by making the dollars

the bulk of the company's shop employees are of foreign birth and have been somewhat slow to take advantage of the saving made possible by patronizing the stores, the business has developed satisfactorily, growing from week to week, and sales have now reached \$2,000 per month.

In establishing the stores the company aimed particularly to aid two classes of its employees, the improvident and the provident. In the former class are those who through bad management of their domestic finances or by spending their earn-



One of the Plant Stores of the Cleveland Hardware Company Showing the Wide Variety of Articles Carried

they earn more valuable, quite a number of manufacturers in the past year have established stores in connection with their plants. These stores, conducted along the line of practical co-operation, have, as a rule, proved successful from the viewpoint of the management, and have the hearty support of the employees as is shown by their patronage.

One of the larger companies that has recently established plant stores is the Cleveland Hardware Company, Cleveland, Ohio, which opened stores at each of its two plants last November. While

ings for drink, have little or nothing left soon after receiving their wages so that the strictest economy must be practised until the next pay day, and, as a result, their families are often deprived of the bare necessities of life, and many fall in the clutches of loan sharks or contract other indebtedness that causes the tying up of their wages. Through the stores the improvident men are extended credit and are able to secure the necessary household supplies without compelling their families to go hungry until the next pay day. The other class particularly benefited by the stores

are the provident employees who want to make a dollar go as far as possible by buying as cheaply as possible.

In conducting the store the buying power of the company is utilized for the benefit of the employees and as this buying power is very large as compared with that of the average small retail merchant and goods are bought in large quantities, bottom prices are secured. In selling there is no necessity for adding to the margin of profit to make up for the losses sustained by merchants who do a credit business, as the payment for goods bought at the company's stores is assured. Goods are sold to employees at about 10 per cent above the cost price, this margin being sufficient to cover the expense of operating the stores. The selling prices are said to average from 25 to 30 per cent below the usual store prices, but in the case of some goods the saving reaches 50 per cent.

The method of conducting the stores is very simple. The employees are furnished with coupon books containing tickets amounting to from \$1.50 to \$5.00, the individual tickets ranging from 1c. to 30c. When an employee makes a purchase he

men and women and various other articles. Milk in pint bottles is peddled throughout the plant twice a day by messenger boys. The bakery is very liberally patronized by employees during the noon hour. A laundry agency is also maintained. In addition to the goods kept in stock, sales of various other goods such as stoves and furniture are made through wholesale houses by catalog or by sample. By an agreement with a wholesale house an employee can go to the wholesale dealer and secure furniture at a large saving in cost. A similar arrangement for the purchase of men's clothing has been made with a tailor. The factory stockroom, which occupies a section of the same floor, is patronized quite freely by the employees. In this department they are able to buy paints, wire, screws and various other products at less than store prices.

### Long Span Coal-Handling Gantry Crane

A coal-handling crane of the gantry order or bridge type has been recently installed by the Whiting Foundry Equipment Company, Harvey,



A Coal Handling Crane of the Bridge or Gantry Type Having a Span of 118 Ft. between the Centers of the Gantry Legs and a 50-Ft. Cantilever at One End

turns in tickets for the required amount or, if he prefers, he pays cash. The coupon books are charged against the employee and the amount is deducted from his wages at the next pay day. The stores are under the management of the assistant auditor of the company, who also acts as buyer. The sales are in charge of two clerks at one store and of one clerk at the other store. In connection with the stores are the factory supply stockrooms from which each department draws its supplies, for which an invoice is rendered to the department each month.

The stores are conveniently located on the first floor with outside entrances as well as entrances from the factory so that wives or children of the employees can make purchases during the daytime, the workmen themselves doing their buying outside of working hours. The line of goods sold is very complete. There is kept in stock a full line of staple groceries, ham, bacon, butter and eggs, bakery goods, candies, tobacco, cigars, garden tools, overalls, gloves, neckwear, hose and shoes for both

Ill., at the plant of the Scranton Electric Company, Scranton, Pa. The span of this crane is quite long, the distance between the centers of the gantry legs being 118 ft. while there is a 50-ft. cantilever at one end. In installing the crane advantage was taken of the runway that was already in position over the coal yard. This runway was used to support one of the gantry legs, an arrangement which saved some room in the yard as well as doing away with the necessity for giving the crane long legs at both ends.

The installation is equipped with the builder's bucket-handling trolley, which is of the three-motor type. Mine type General Electric motors, wound for three-phase, 60-cycle, 440-volt, alternating current are used, one for the closing line, one for the holding line and the third to travel the trolley. In this way the cage is attached to the trolley and moves with it, an arrangement, which it is pointed out, enables the operator to watch the bucket at all times readily.

The total height of the crane is 53 ft. and the

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depth of the entry is slightly over 12 ft. The equipment has an hourly capacity of 100 tons for unloading coal from the cars to the storage pile and from the storage pile to the conveyor that is used in connection with the power house.

### A Device for Wireless Telephony

An ultradion detector and amplifier, so called, is exhibited in the Palace of Liberal Arts at the Panama-Pacific International Exposition. The device is to pick up sound waves coming from a distance and step them up to such an extent as to transform them into intelligible symbols of language. The detector resembles an ordinary electric light bulb in external appearance except that there are openings at either end. The interior is filled with gas and is lighted by a special composition filament from an independent storage battery and contains several coils of wire and two thin sheets of metal. Several grid-shaped pieces of nickel wire are also interposed between the filament and the two plates. Constant streams of ions carrying negative electricity pass between the light filament and the plates as soon as the gas is heated. Other impulses coming in deflect or retard the movement of these ions, this producing the variation in the volume of the sound given out by the amplifier.

One of the applications of this device is in connection with the wireless telephone. It is claimed for this system that none of the resonances so commonly found are present and natural tones are heard exactly as they are spoken, no louder, no softer. Another feature is that there is no interruption by the party at the receiving end, as it is necessary to cut out the listening apparatus before bringing the transmitting into the circuit. The receiving side is dead while messages are being sent and the reverse is true when they are being received. The instrument is alive only to the impulses sent out by the other instrument, outside electrical influences having no effect except under severe conditions.

The mechanism of the detector and amplifier is contained in a plain box measuring 18 in. in height, 24 in. in length and 12 in. in width. It has been possible to hear wireless impulses as far away as from Eilvesen, Germany, a distance of over 7500 miles, clearly, and the time signals are received each day by wireless from Washington and made loud enough to be heard a dozen feet away from the instrument. After the current has been amplified it is strong enough to ring an electric bell.

### Roof Construction Increases Furnace Yield

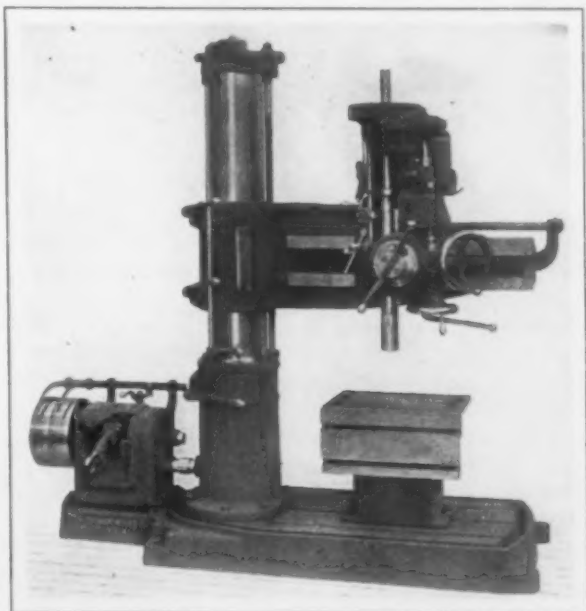
For the past three or four years the Illinois Steel Company has operated its open-hearth furnaces with the Orth ribbed-roof construction. Exceptionally good results have been obtained. In the year 1914 the average production per roof on all of the furnaces of the No. 2 open-hearth department was 24,600 tons. These furnaces are rated at fifty tons, and, with the exception of one furnace in which tar was used, all were fired with producer gas fuel. This record, which is representative of the results steadily obtained with the Orth roof during its use at South Chicago, compares with an average production of 17,041 tons previously obtained with ordinary roofs. In addition to the prolonged life of the roof due to the ribbed construction, it is possible more freely to shut down the furnace for cleaning checkers or other repairs than with the ordinary roof where there is the attendant hazard of losing the roof when furnace operations are resumed. It is possible, therefore, with the stronger roof, to keep the furnace in better operating condition which reflects itself in larger production and lower operating costs.

The Cleveland Punch & Shear Works Company, Cleveland, Ohio, has shipped two 90-in. all-steel motor-driven presses of the guillotine type to the Carnegie Steel Company and is now building three all-steel tie-plate machines for the same company.

### Heavy Duty Radial Drilling Machine

The Fosdick Machine Tool Company, Cincinnati, Ohio, has made a number of changes in its 3-ft. radial drilling machine which was illustrated in THE IRON AGE, July 31, 1913. These improvements are principally in the base, the table and the column with a view to providing strength and preventing the oil channels from becoming clogged.

The base is surrounded by an oil channel running completely around the column. The flange on the outer side of the channel is level with the work-



A Recently Developed 3-Ft. Radial Drilling Machine of the Round Column Type Equipped with a Separate Table

ing surface of the base, thus enabling the machine to be embedded in concrete so that the working surface does not project above the floor. The channel has its high point at the outer end of the base and drains around both sides to the rear of the column. This arrangement is relied upon not to impair the strength of the base immediately in front of the column and also to enable the operator to keep the channel from becoming choked with chips without leaving his position.

The table is a separate one, which can be placed in any position on the base which has a set of three longitudinal T slots. The bolt holes are located so that when the table is fastened to the outer T slots by bolts the side apron overhangs the edge of the base which enables large work to be clamped to the table. This arrangement also enables two tables to be used, and a pit to receive large castings may be located at either side of the machine. The table has channels for the cutting lubricant, which lead to a pocket in one corner that can be drained into another receptacle. In this way the necessity of using a pump and piping for an occasional steel drilling or tapping job that requires the use of lubricant is avoided.

The use of this type of table, it is explained, enables the lower end of the column to be considerably reinforced, although, if desired, swinging and tilting tables of the builder's various standard types can be furnished. Additional reinforcing ribs are provided for the column and the arm. Screws placed adjacent to the binders on the column are relied upon to prevent sagging when the arm is unclamped.

In addition to the 3-ft. machine illustrated, 3½, 4, 5 and 6 ft. sizes are built.



# Many High Speed Tool Steels\*

Their Heat Treatment and a Theory of Their Constitution—Eight Variables and Numerous Combinations

BY FRED. C. A. H. LANTSBERRY

High speed steel is a material which may be very complicated in composition. It may contain as essential constituents iron, carbon, silicon, manganese, tungsten, chromium, vanadium, molybdenum and cobalt, many of the ultra steels containing as many as eight of these elements. The range of composition of the English high speed steels is: Carbon, 0.45 to 0.85; silicon, trace to 0.2; manganese, 0.1 to 0.5; tungsten, 8.0 to 18.0; chromium, 2.5 to 6.5; molybdenum, 0.0 to 2.0; vanadium, 0.0 to 1.5, and cobalt, 0.0 to 5.0 per cent. It now becomes clear why so little is known about high speed steel in spite of the enormous amount of work which has been done in the subject.

With eight variables it is possible to get a very large number of combinations, and judging from the large number of high speed steels on the market, it would appear that the steel makers have exercised all their ingenuity in this respect. During the last five or six years the writer has had upward of forty different brands through his hands. Analyses of three of the most satisfactory of these ultra steels on the market at the present time are:

	Steel No. 1, Per Cent	Steel No. 2, Per Cent	Steel No. 3, per Cent
Carbon .....	0.60	0.64	0.63
Silicon .....	0.30	.....	.....
Manganese ..	0.04	0.16	.....
Tungsten ....	14.62	17.77	14.76
Chromium ...	3.58	2.51	4.27
Vanadium ...	1.04	0.95	1.00
Molybdenum.	0.54	None	1.22

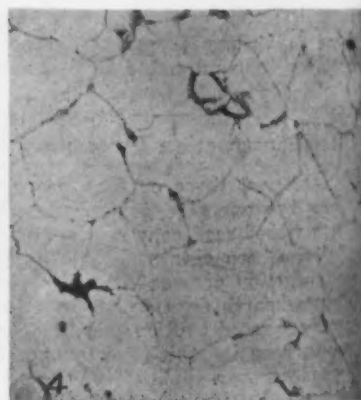
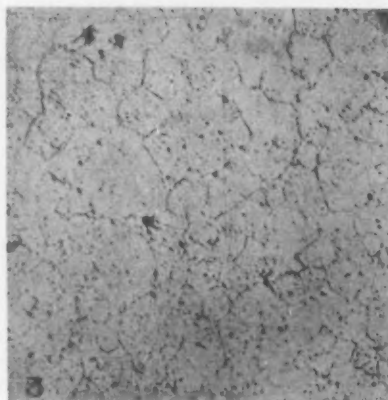
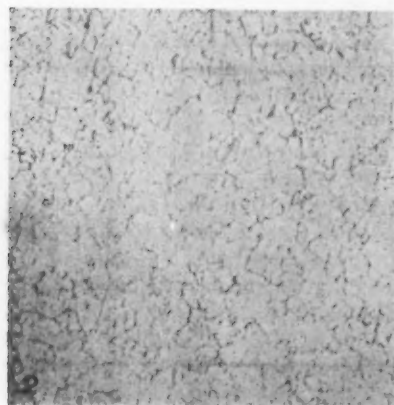
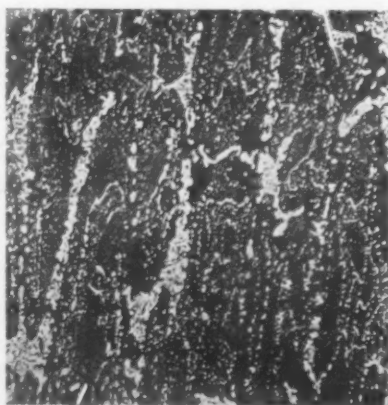
value could be obtained. The writer's experience confirms that of Taylor, that the only real guide to the efficiency of any class of cutting tool is to test it to destruction.

## HEAT TREATMENT OF HIGH SPEED STEELS

On account of the stiffer nature of the material it is necessary to forge high speed steels at a temperature much higher than that generally adopted for ordinary carbon tool steels. Forgings should not be carried below 1000 deg. C.; otherwise the development of incipient cracks is very likely to occur, and although these cracks may not be visible they are sure to cause trouble in the subsequent hardening process.

Annealing can be effected by prolonged exposure to temperatures not exceeding 800 deg. C., and in

the hands of the user of high speed steel this treatment is much more satisfactory than the one adopted by the manufacturer who anneals the steel by prolonged exposure to temperatures in some cases above 1000 deg. C. There is method in this madness for the preliminary annealing, but the writer sees no necessity for its adoption by the user of the steel where the problem is a somewhat different one, as will be pointed out in the section dealing with the theory of high speed steel.



Photomicrographs of High Speed Tool Steels. Fig. 1 shows the structure of a very large bar of high speed steel intended for cutters of large diameter. Fig. 2 shows the structure of a correctly hardened piece. Fig. 3 is the structure resulting from heating the same steel as Fig. 2 for five minutes or three minutes longer than Fig. 2. Fig. 4 reveals the effect of heating the same steel as Fig. 3 only two minutes but at 70 deg. C. higher or at 1290 deg. C.

The existence of so many varieties of high speed steels makes the task of the engineer or the works manager who has their selection a very difficult and thankless one. After fourteen years of experience Taylor came to the conclusion that a tool should be ruined before any indication of its true

\*From a paper read before a recent meeting of the West of Scotland Iron and Steel Institute at Glasgow, Scotland. The author is with the Birmingham Small Arms Company, Birmingham, England. The paper is based on his extended investigation of high speed steels.

It has already been pointed out that it is necessary to heat high speed steel to temperatures varying on the melting point of the steel in order to develop the quality which has been called red-hardness. This heating can be carried out in any of the ordinary coke, gas or oil fired furnaces which are used for the heating of steel. The temperature of the furnace should be controlled by means of a pyrometer, for it is by no means true that high speed steel cannot suffer by being overheated. The



author is of the opinion that a temperature between 1200 and 1250 deg. C. is the best for hardening high speed steel. Many writers state that a temperature of 1300 deg. C. is necessary to properly harden high speed steel, but in this connection it is necessary to point out that the measurement of temperatures above 1000 deg. C. is a very difficult matter in a laboratory, and becomes still more difficult when the operation has to be carried out under working conditions. Still this does not detract from the use of a pyrometer in controlling operations so as to insure their always being carried out under uniform conditions. In the writer's opinion, however, it is to this difficulty in accurately measuring very high temperatures that the variation in the hardening temperature of high speed steel, as stated by different writers, is due.

Salt baths form a very convenient medium for the hardening and tempering of high speed steels. For hardening, the salt used is barium chloride, and this is best heated by means of alternating current of low voltage. Such electrically heated salt baths offer the advantage of great uniformity of temperature which can be easily controlled, and for small articles give excellent results. Larger tools are, however, liable to crack owing to the rapidity of heating, and require to be preheated at a temperature of about 800 deg. C. before immersion in the salt bath. On large articles these salt baths have a most peculiar effect and one about which the writer showed a good deal of scepticism for a very long time. There is a tendency for the tools hardened in this way to have a soft skin owing to decarbonization. In tools which have to be ground this does not affect the finished tool, but in form cutters the defect is so serious as to render this method of hardening untenable.

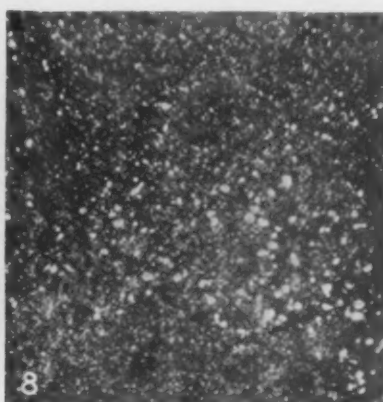
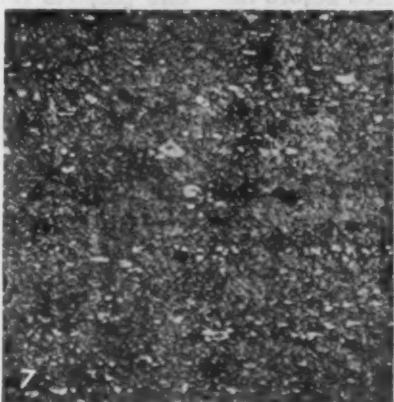
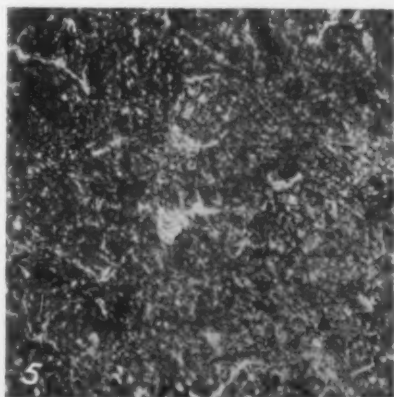
For a long time the author was inclined to think that the trouble was brought about by

to combination with free chlorine which is formed in the bath. It is true that on prolonged use the bath does become alkaline owing to the formation of barium oxide, but free chlorine is never detected in the vapors which are evolved from the surface of the bath. The writer has always attributed this formation of barium oxide to the action of moisture at high temperatures, for it is certain that the vapors do contain considerable quantities of hydrochloric acid.

The tempering of high speed steels is effected at all temperatures between 0 and 700 deg. C., according to the composition of the steel and the use for which the tool is intended. For temperatures up to 300 deg. C. oil baths are used, but above this temperature the use of oil is attended with considerable danger. Above 300 deg. C. lead baths may be used, but the author prefers to use baths of fused salts. Up to 550 deg. C. the eutectic mixture of potassium and sodium nitrates can be used, and for temperatures in the neighborhood of 600 to 700 deg. C. a mixture of sodium, calcium and potassium chlorides melting at 500 deg. C. can be applied.

#### THEORY OF HIGH SPEED STEELS

In face of the recent discussion on the cause of the hardness of plain carbon steels after suitable treatment, it would appear to be somewhat premature to think about a theory for the hardness of high speed steel which, in addition to being such a complex body, offers the further complication of possessing two kinds of hardness. Still, since no one has yet produced a steel tool containing no carbon it must be presumed that this element is the chief cause of the cutting properties of steels. Therefore any theory for the cause of the hardness of high speed steels must be based on the hypothesis for the cause of the hardness of carbon steels.



Photomicrographs of High Speed Tool Steel. Fig. 5 shows how the structure from improper treatment persists when once conferred though heated for some time at 750 deg. C., a treatment which usually obliterates completely the features of the structure of properly hardened steel. Figs. 6, 7 and 8 show the effect of tempering on the structure of high speed steels which have been correctly hardened. Fig. 6 represents a steel tempered at 490 deg. C.; Fig. 7, one tempered at 680 deg. C., and Fig. 8 can be regarded as typical of annealed high speed steel.

the adherence of a thin layer of air to the tool which oxidized away the carbon during the heating, which is somewhat prolonged in the case of large tools. An endeavor was made to remove the difficulty by first immersing the tool in a bath of low melting salt in order to thoroughly wet it before subjecting it to the high temperature. Although this improved matters it did not entirely remove the difficulty. Recent work by Continental investigators appears to indicate that the carbon removal is due

The earliest theory of high speed steel was one enunciated by Böhler in 1903. His idea was that the tungsten and chromium together lower the pearlite change to a temperature below atmospheric, so that at the ordinary temperature the stable state of high speed steels was the hard state. It has since been proved by many workers that instead of lowering the critical temperature at which the carbon is thrown out of solution, chromium actually raises the temperature, with

the result that chromium should tend to make it more difficult to keep the carbon in the hardening form. The elevation of the change point is considerable, being about 10 deg. C. for each 1 per cent of chromium added. Another point of importance is that the critical point is to all intents and purposes independent of the temperature from which the alloy has been cooled. The effect of chromium, therefore, must lie in the direction of double carbides, the existence of which in annealed steels has been proved by the work of Professor Arnold, but, unfortunately, his work in this field was not extended to hardened steels.

With regard to the effect of tungsten on the transformation points of pure iron-tungsten alloys, Harkort showed that the temperature of the conversion of alpha into beta iron and vice-versa was not affected by the presence of tungsten. The temperature of the beta-gamma change, however, was raised, a 5 per cent addition of tungsten raising the upper transformation point by 30 deg. C. At the same time, however, the intensity of the reaction diminishes, showing that the amount of gamma iron converted into beta diminishes as the content of tungsten increases. Since the intensity of the beta-alpha change remains constant there must be a certain amount of beta iron produced by a decomposition of the iron-tungsten compound which is deposited from the melt.

The work of Swinden on a series of steels containing about 3 per cent of tungsten and varying amounts of carbon showed that if the heating were not carried unduly high the cooling curves of these steels were not sensibly different from similar carbon steels containing no tungsten. If, however, a certain temperature be exceeded the resulting curve shows a marked lowering of the  $A_r$  point, viz., from 680 deg. C. to 570 deg. C. The lowered temperature is constant, but the temperature to which the steel must be heated in order to bring about the lowering increases with the carbon content. The earlier work of Carpenter had indicated that the critical points of tungsten and molybdenum steels were influenced by the temperature to which the steel had been heated before the cooling curves were taken, but his results appeared to indicate that the action was not a simple lowering of the critical temperature, but that the transformation was split up into two parts, one of which took place at a very low temperature.

Probably the most instructive results which have been obtained on the theory of high speed steels up to the present were those obtained by Edwards and published in the Carnegie Memoirs of the Iron and Steel Institute for 1908. Edwards worked on two series of steels, one containing a constant chromium content of about 6 per cent and a tungsten content which gradually increased from 0 to 19 per cent, while the other series contained a constant tungsten content of about 18 per cent and a chromium content which gradually increased from 0 to 8 per cent. His results show that so long as the initial heating temperature is not raised above 950 deg. C. the addition of tungsten has no influence on the position of the critical points. If, however, the alloys be initially heated to 1320 deg. C. the subsequent cooling curves show that the critical point is split up into two parts, an upper and a lower part. The upper point is slightly raised while the lower point occurs at a temperature of between 420 and 470 deg. C. That this action is directly due to the tungsten is shown by the fact that the cooling curve of the alloy containing no tungsten is not affected by the temperature of initial heating.

There can, therefore, be no doubt that to whatever the particular properties of high speed steels are due they are not caused by the lowering of the critical points to below the ordinary temperature, because under normal conditions of heating and cooling chromium raises the  $A_r$  point and tungsten does not affect it at all. Since tungsten steels only develop the low critical point when cooled from high temperatures, it would appear that this point is independent of the true  $A_r$  point, and is brought about by a carbide of tungsten which is only produced at high temperatures. It may, however, be due to the formation of a tungstide of iron since the probability of the existence of such a compound has already been foreshadowed by the work of Harkort. In a tungsten-chromium steel, however, this lower point is found to disappear when the chromium exceeds a certain amount and the alloy is cooled from a very high temperature. It would appear, therefore, that in high speed steel the effect of heating to temperatures in the neighborhood of 1250 deg. C. is to produce a double carbide of tungsten and chromium in the form of a solid solution in gamma iron. The presence of the chromium raises the temperature at which the carbide is thrown out of solution, rendering it possible to work at a much higher temperature in cutting, and at the same time the double carbide is a much more stable body than carbide of iron. The subject is bristling with difficulties and pitfalls for the unwary.

In his book on the art of cutting metals, Taylor says that the two methods yet devised by scientists for determining the most important quality in the new high speed steels are ineffective, but the writer disagrees with this conclusion, and at the present time has an elaborate research in progress with the object of throwing more light on this complicated branch of metallurgy. It was hoped that some of the results would be available for presentation to this meeting, but causes which will be apparent to all of you have prevented it. It is expected that the application of the examination of residues will throw considerable light on the nature of the double and possible treble carbides which there seems no doubt exist and play an important part in the properties of high speed steels.

#### MICROSTRUCTURES OF HIGH SPEED STEELS

The study of the microstructures of high speed steels is a most fascinating one, and it is now proposed to deal with this subject here as briefly as possible.

Fig. 1 shows the structure of a specimen cut from a very large bar of high speed steel intended for the manufacture of cutters of large diameter. Considerable trouble was experienced with the cutters when made, and investigation indicated that the structure is the typical cast structure of high speed steel. The amount of heating and mechanical work resorted to in the rolling of the bar from the ingot had not been sufficient to confer the typical fine structure to the steel. A peculiar feature in this case was that the structure persisted after hardening, although it took a somewhat longer time to develop on etching. It was found that the only methods of obliterating this structure were either by forging or by a prolonged heating at temperatures above 1000 deg. C. Herein lies the explanation why it is advisable that the annealing carried out by the steelmaker should be effected at high temperatures. It is because of the fact that in these high speed steels the diffusion of the various constituents into each other is very slow, with the result that the large casting structure can only



be effectively removed by some very drastic treatment.

In one of his papers Professor Carpenter says that it is impossible to overheat high speed steels, but many of us who have had to deal with high speed steels in large masses have found that this statement is an erroneous one. Fig. 2 shows a piece of high speed steel which the writer considers as correctly hardened. It was heated to a temperature of 1220 deg. C. for a period of two minutes and then quenched in whale oil. The structure is a fine austenitic one, but it will be seen that there are specks of an apparently different constituent from the ground-mass scattered over the surface. Fig. 3 has been heated for five minutes at the same temperature. Here it will be seen that the grain has become considerably coarser. Fig. 4 shows a piece of steel of the same composition heated for two minutes to a temperature of 1290 deg. C. Such treatment at a temperature only 70 deg. C. higher than the last has produced an entirely different structure. The grains have become very coarse and call to mind the cored structure of solid solutions. At the same time a new intergranular constituent has made its appearance. The persistency of the structure when once conferred on high speed steel is illustrated by Fig. 5, which illustrates the over-heated specimen after heating for some time at 750 deg. C., a treatment which, as will subsequently be shown, completely obliterates the features of the structure of what we might call properly hardened high speed steel.

In one of his papers Edwards attributes the breakdown of high speed tools in use, not to the loss of red-hardness, but to the appearance of a new constituent which is brittle. The writer has examined many samples of steels tempered at all temperatures on the scale, but has never found the brittle constituent which appears to be similar to the constituent produced by the process thought to be impossible when Edwards made his experiments.

The next three photomicrographs, Figs. 6, 7 and 8, show the effect of tempering on the structure of high speed steel which has been correctly hardened. No change in the structure is effected by tempering below 450 deg. C. Carpenter states that no change is effected below 550 deg. C., but the author has found that the point at which tempering begins is largely affected by the temperature at which hardening was carried out. In any case, however, tempering certainly begins at some temperature between 450 and 500 deg. C. In the micro-structure, tempering is first made apparent by a darkening of the surface after etching. In Fig. 6, which represents a steel tempered at 490 deg. C., the outlines of the grains can still be faintly discerned, but as the tempering is continued the outlines disappear and white specks make their appearance, as shown in Fig. 7, which has been tempered at 680 deg. C. Large numbers of these can be seen in Fig. 8, which can be taken as representing the typical structure of annealed high speed steel. This specimen was tempered at 750 deg. C., and it is interesting to compare the structure with that illustrated in Fig. 5. It is evident, therefore, that the effects of maltreating high speed steel can only be removed by prolonged annealing, because of the diffusion of the complicated carbides formed at high temperatures being very slow indeed.

The city of Covington, Ky., has awarded a contract to the United States Cast Iron Pipe & Foundry Company for 2000 tons of 24-in. cast-iron pipe for the construction of an emergency main. The pipe will be shipped from the company's plant at Addyston, Ohio.

## A Comprehensive Welfare Department

Announcement has been made by Theodore Mueller, superintendent of the plant of the Standard Sanitary Mfg. Company at Louisville, Ky., of the formation of the Standard Sanitary Welfare Department, which aims to solve the problems raised by sickness, not only for the workmen but for their families. Membership in the organization is not compulsory. Married men pay 70 cents a month dues and single men 40 cents. The department maintains a physician who attends members and their dependents, and furnishes medicines, hospital service, and whatever else is required in case of sickness.

The extension of the welfare idea to include the families and dependents of employees, as well as the men themselves, seems to be a popular move, judging by the number of those who have joined. The department has already taken care of five major operations which have become necessary, and as each of these would have cost not less than \$200 the benefit derived by the members is evident.

The company, of course, is continuing to pay all expenses incurred through accidents in its plant, and has enlarged its facilities in this direction through the equipment of a new hospital. The hospital work was formerly handled in part of a warehouse building, but owing to the fact that the new welfare department requires a considerable stock of medicines to be carried, a new building, located on land adjoining the plant, has been fitted up. It consists of a reception room, consulting room, a room for dressing minor injuries and an operating room. No provision has been made for beds, though this may come later. At present cases requiring hospital treatment are taken to the Jewish Hospital in Louisville.

Mr. Mueller says that, including the dependents of members, 2000 people are now being taken care of by the welfare department. The physician who is employed is at the plant for consultation from 8 to 9 a. m. and from 1 to 2 p. m., and is also available at his office, besides making calls where necessary. Nurses as well as medicines are provided when they are needed, and, in short, the cost of sickness, which is often a heavy burden on working people, is reduced to a nominal amount, the annual charge on a married man, for instance, being but \$8.40.

## New Method of Coating Iron or Steel with Lead

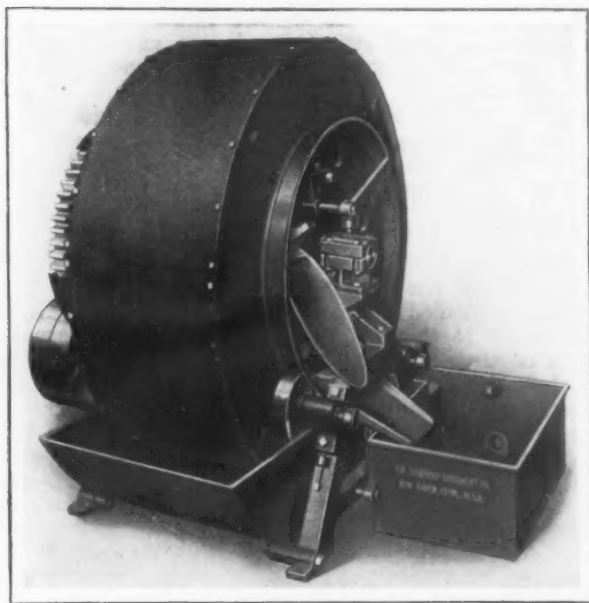
Coating the surfaces of iron or steel with lead or its alloys so that a continuous and uniform film is successfully and tenaciously applied is the subject of a recent patent (U. S. 1,144,523—June 29, 1915). It has been granted to Jay C. Beneker, of Cincinnati, Ohio, and covers the coating of relatively corrosive metals with a protecting film. The patentee's efforts have been directed to finding a commercially satisfactory way of producing a better substitute for zinc, and one less costly than tin.

The patentee claims originality in a process based on certain metallurgical and physical discoveries. After the iron or steel surface has been cleaned of scale or oxide, it is subjected to a suitable flux, such as zinc chloride, and submerged in a melted bath of lead containing a little cadmium. Ordinary commercial lead possesses but little affinity for iron but in the presence of metallic cadmium, even in very small quantities, it will amalgamate with the iron surface so as to coat it with a very thin film. The inventor, under ordinary practical commercial conditions, preferably uses as small an amount as 0.17 per cent but can use as high as 1 per cent of cadmium. The smallest possible amount is recommended as cadmium is expensive. Since it tends to oxidize and pass into the flux, causing a loss, the addition of about ½ per cent of zinc to the lead bath prevents this, since the zinc oxidizes first and passes into the flux in preference to the cadmium. Cadmium, being more positive than iron, its presence in the lead tends to protect the iron the same as zinc. It also is claimed to promote and subsequently maintain the adherence of the film of lead.



### Cinder Crushing and Pulverizing Mill

The Standard Equipment Company, 47 Orange Street, New Haven, Conn., has brought out a cinder crushing and pulverizing mill. This mill, which has been designed by Charles A. Dreisbach, the inventor and designer of the New Haven sand blast rolling barrel, which was illustrated in THE IRON AGE, Oct. 20, 1910, is intended for reclaiming all kinds of metal from ashes, slag, skimmings and sweepings, as well as for crushing soft rock,



A Recently Developed Cinder Mill for Reclaiming Various Metals from Ashes, Slag, Skimmings and Sweepings as well as Crushing Soft Rock and Cement in Which the Crusher Rolls Do Not Come in Contact with the Drum

cement, glass, etc. Either the wet or dry process can be used and the crushing rolls do not come in contact with the drum.

In the accompanying illustration the machine is shown with the charging hopper dropped to discharge the metal. This hopper can be raised so that the edge is horizontal when it is desired to feed the material into the mill. The machine is driven by a belt connection with an overhead countershaft or other source of power, there being a tight and a loose pulley mounted on the shaft at the back of the machine. From this shaft the power is transmitted through a gear to the center roll shaft on which the gear, which is barely visible to the left of the illustration, is mounted. The conveyor drum is driven from this center shaft by a chain and sprocket. The front and back heads are bolted to frames having brackets to support the bearings for the center roll shaft. The crushing rolls are made of iron with herringbone corrugations and the idler roll which is held in place by a cast steel yoke is mounted on a separate shaft. If desired the rolls can be replaced by removing one of the shell plates of the drum and drawing the shaft out through the hole in the head, a tapped hole in the front end of the idler roll shaft being provided for the insertion of a draw bolt. The conveyor drum is supported by four rollers having long bearings and provision for taking up wear.

In operation the material is fed into the charging hopper through a series of buckets mounted on the inner surface of the drum. These discharge into a chute that delivers the material directly into the rolls. The crushed material falls to the bottom of the conveyor drum and is raised again by the buckets, the operation being repeated until the material is crushed fine enough to flow through

the opening connecting with the charging hopper in its lowered position. When it is desired to discharge metal from the drum, the handle controlling the position of the charging hopper is shifted to the right, as shown in the accompanying illustration. This drops the charging hopper and swings the controller chute into position to discharge the metal dumped from the buckets into the discharging chute and out of the hopper into the receiving box.

When the wet process is employed, the water tank which is below the mill proper, is almost filled with water. As the drum revolves the water passes in through openings and empties into the bottom of the drum. In this way the water entering at the bottom of the drum is forced up through the metal and the cinders, the crushed cinders being washed out into the settling tank, and the water flows back to the water tank, thus enabling the water to be used over and over again and dispensing with the use of the pump.

In a test of this mill it has been found that the amount of metal wasted in the final dross or mud is less than 1 per cent. This saving in metal is equal to 20 lb. per ton of mud which, at a cost of 12 cents per lb. means a saving of approximately \$720 per year.

### Two Machines for Automobile Radiators

F. H. Stolp, 92 Brook Street, Geneva, N. Y., has recently shipped two automatic automobile radiator machines to England. These have been installed in the plant of the Coventry Motor Fittings Company as the result of an investigation made a little time ago, looking toward the Americanization of its manufacturing methods. One of the machines is a draw bench for producing the tubes, while the other is a self-feeding press for turning out the radiator fins.

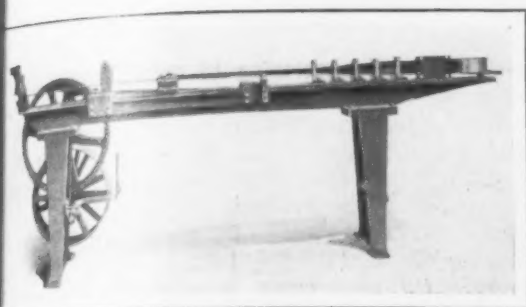
The tube drawing machine will draw tubing or molding in any form from a flat ribbon of any metal with either a plain or lock seam. After the tube has been drawn, it can be cut off to any predetermined length automatically, if so desired. The capacity of this machine is enough tubes to make 200 automobile radiators per day.

The other machine is an automatic self-feeding punch press, which has been designed to take the place of an ordinary punch press with a roll feed. It is adapted to make radiator fins in one operation, the edge being folded over and the perforating and



An Automatic Self-Feeding Press That Will Turn Out Radiator Fins Complete in One Operation

July 29, 1915



Draw Bench for Producing Tubes for the Radiators of Automobiles from a Flat Ribbon and Cutting Them Off to the Desired Length Automatically

cutting off to the desired length being accomplished in a single operation. In the illustration of this machine a fin is shown after it has been formed. The stock for this machine is fed from a reel which is mounted on the right of the machine, as shown in one of the accompanying illustrations. This machine has a capacity to make fins for fifty radiators per day.

### Machine for Cutting Off Copper Bands

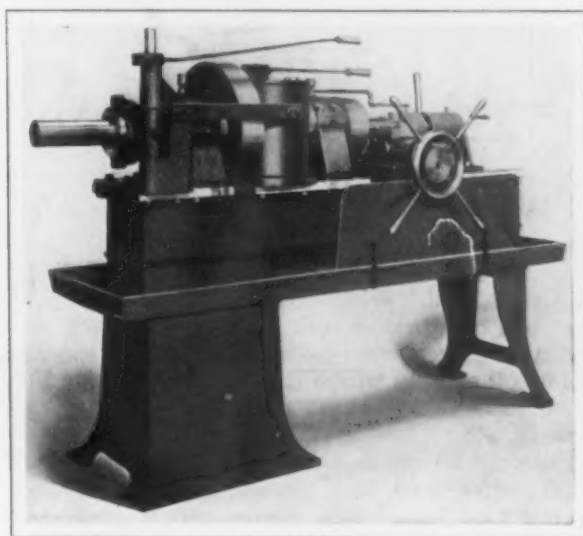
The Automatic Machine Company, Bridgeport, Conn., has brought out a machine for cutting the copper bands used on shrapnel and high explosive shells. Two sizes are built, the smaller for handling work having a maximum diameter of  $3\frac{3}{4}$  in., while the capacity of the other is 3 in. greater. The essential feature of the machine is the use of a large cast-iron hollow spindle with a spring collet chuck and spring feeding fingers which extend almost to the back of the tube holding chuck. In addition to cutting off the copper bands, the machine by being slightly modified can also be employed for trimming either end of the shells, for finish turning the bands, for cutting steel tubing and other classes of work where a large hollow spindle with a spring collet chuck can be used.

The operation of the machine is controlled by two hand levers above the headstock and a pilot wheel on the cross feed slide. A releasing device is provided on the tailstock, which is relied upon to prevent the revolving tube from coming in contact with the tailstock while the tube is being cut off. The long lever on the headstock controls the feeding of the tube, while the shorter one controls the opening and closing of the chuck.

The cross slide is regularly fitted with one tool post, although front and back posts can be furnished if desired. Multiple tool holders on the tool slide enable from three to six rings to be cut off simultaneously, and the time required for feeding, chucking and cutting off this number of bands is approxi-

mately 30 sec. The capacity of both sizes of machine is 18 in. between the face of the chuck and the stop, it being, of course, possible to adjust the latter for any intermediate length. A stock support with a base for bolting to the floor at the rear of the machine is furnished to enable long pieces to be handled readily.

The machines are driven by a 4-in. belt, and the steps of the driving cone pulley are 9 and 10 in. in diameter respectively. In the smaller machine the ratio of the headstock gearing is 27 to 55 and in the larger 24 to 72, the pitch in both cases being 4 and the face width 3 in. The equipment regularly furnished with the machine includes a countershaft with tight and loose pulleys 12 in. in diameter, with a 5-in. face, an oil pump, pan, tank, necessary piping, gear guards and the tools for handling a single length and diameter of tube. The speed of

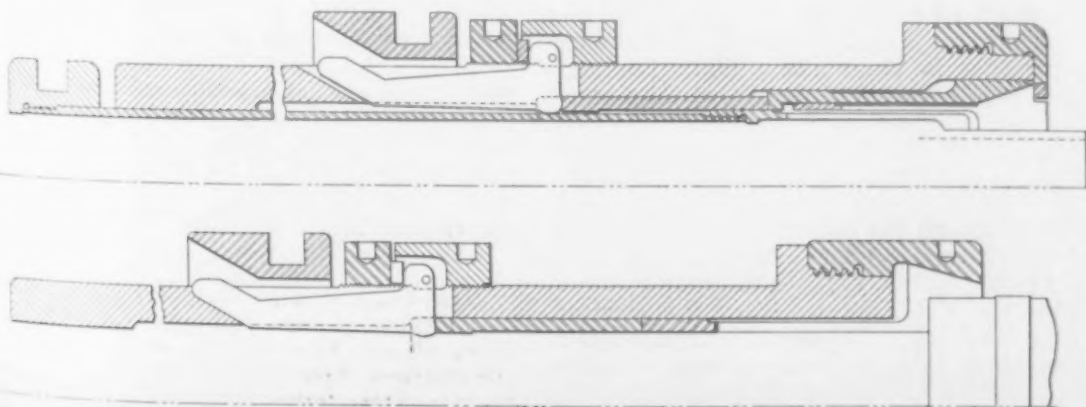


A Machine That Has Recently Been Developed for Cutting Copper Bands from Tubing for Use on Shrapnel and High Explosive Shells, Turning the Bands and Other Work for Which a Large Hollow Spindle with a Spring Collet Chuck Can Be Used

the countershaft in the case of the smaller machine is 600 r.p.m. and 750 r.p.m. for the larger.

If desired the feed fingers can be removed from the chuck, thus enabling stock  $\frac{1}{2}$  in. larger in diameter to be handled in both cases.

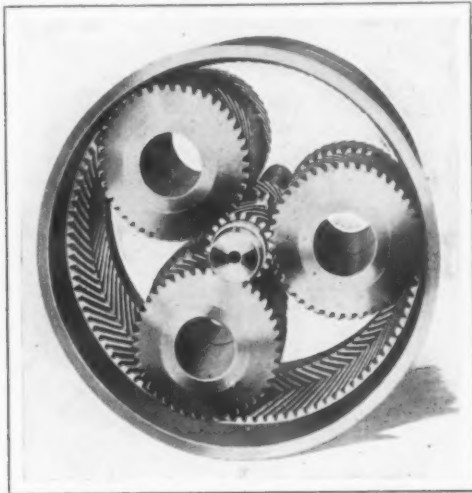
John H. Hile has been appointed receiver for the Universal Swing Joint Company, which has been operating a plant at Ninth and Jefferson Streets, Louisville, Ky., for some time. Suit was recently filed against the company by the bondholders. The plant was formerly operated by the Kentucky Gear & Machine Company.



Drawing Showing the Construction of the Spindle Employed for Cutting Rings and Turning Bands

### A New Type of Speed Changing Gear

A speed changing gear that can not only be used for reducing the speed of a prime mover to correspond with that of the driven machine, but also for raising the speed, has been brought out



A Recently Developed Speed Changing Gear for Reducing the Speed of Steam Turbines and Electric Motors or Increasing That of Steam or Internal Combustion Engines

by the Turbo-Gear Company, Industrial Building, Baltimore, Md. With this gear it is possible to secure a slow speed with an electric motor or a steam turbine as well as bringing up the speed of gas or oil engines where it is desired to drive high speed machines, such as centrifugal pumps, blowers, etc.

The device consists of a large internal double helical gear made from a special analysis open-hearth steel forging, a double helical pinion cut integral with the high-speed shaft and intermediate gears of manganese bronze. These gears are mounted on hardened and ground steel shafts, which are secured to the slow speed member by the taper fit and Woodruff keys. The slow-speed shaft is secured to the slow-speed member which is mounted on two heavy duty ball bearings located one on each side of the gears and supported directly by the housing. In this way, it is pointed out, the slow-speed member and shaft carrying the intermediate gears and the high-speed shaft and pinion are not dependent on each other for support, this being furnished by the housing.

The housing is a grey iron casting split horizontally to give access to all the interior parts. Ribs provide a rigid support for the gear members, and the bearings of the high and low speed shafts have caps to guard against the entrance of dust.

The high-speed shaft has a central passage through which oil for lubrication is pumped and a continuous stream is sprayed on the gears through radial passages in the pinion. While the high-speed bearings have forced feed lubrication which is considered sufficient under ordinary conditions, oil rings and an oil reservoir are furnished for emergency use. The surplus oil from the high-speed bearings is collected by a centrifugal oil ring and forced through the hollow shafts carrying the intermediate gears. After lubricating the bearings and gears, oil is drained to the main oil reservoir in the base of the housing where it is strained, cooled and returned to the pump to be used again.

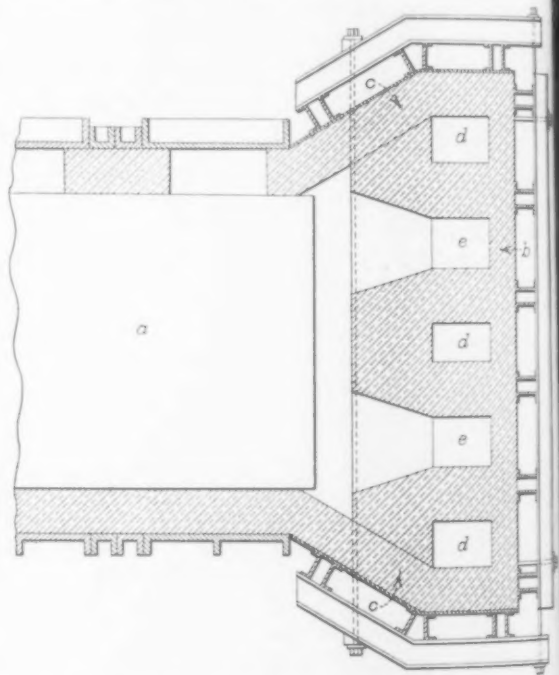
These gears are built in a number of ratios ranging from 8.5 to 1 and to 16 to 1, and speeds of the high speed shaft of 500 to 6000 r.p.m.

### A New End Construction for Open-Hearth Furnaces

An invention relating to open-hearth furnaces with special reference to a novel end construction is the subject of a patent (U. S. 1,143,690—June 22, 1915) granted to J. C. Davis, fourth vice-president of the American Steel Foundries, Chicago, Ill. The products of combustion in open-hearth furnaces attain their maximum temperature at the end of the furnace opposite to that from which they enter, usually near the end of the bath and close to the end walls of the furnace which deflect the gases down into the uptakes and slag pockets leading into the regenerators. It is these walls that burn out much more quickly because of the high temperature and force of the gas.

To overcome or modify this the patentee designs a furnace which shall allow the gases to expand immediately after leaving the main part of the furnace, thus reducing the velocity in proportion to the change in volume caused by the expansion. It is claimed that while the same number of heat units will be present in the exhaust gases the heat will be less intense and because of the lessened velocity it will be the more readily radiated without destroying the furnace walls.

The illustration is a horizontal section through a portion of such a furnace with the new end construction. At one end of the conventional open-



A New End Construction for an Open-Hearth Furnace

hearth furnace *a*, is the end wall *b*, considerably wider than the furnace itself, and connected to it by diagonal walls *c*. The air flues *d* and the gas flues *e* are built within the end construction. It is claimed that the gases being of greater volume and decreased velocity, due to this new construction, will transmit less heat to the surrounding walls which, on account of their greater area, will absorb this heat with less damage to themselves.

The Atwater Mfg. Company, Plantsville, Conn., manufacturer of clips, bolts, etc., has elected the following officers: President and treasurer, A. M. Smith; vice-president, Bradley Barnes; secretary, John Hemingway. These three, with J. H. Pratt and L. Davis, constitute the board of directors.



## Box Column Upright Drilling Machine

A heavy duty box column type drilling machine has been developed by the Rockford Drilling Machine Company, Rockford, Ill., that will drill holes up to a maximum diameter of  $2\frac{1}{2}$  in. in steel. Three special driving arrangements can be furnished to suit the requirements of various cases. These are a pulley that gives only one speed with friction for starting and stopping the machine; a two-step back geared cone pulley and a double friction pulley countershaft that will give four speeds forward and four in the reverse direction, eight speeds forward; while the third uses either an adjustable or constant speed direct-connected electric motor.

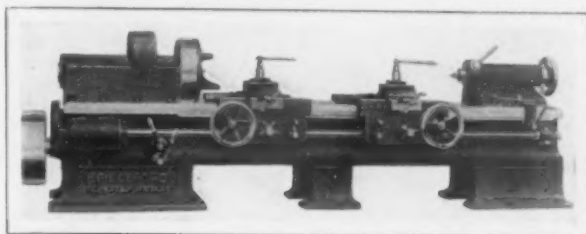
Only one set of bevel gears, which run at a high rate of speed, is used in this machine. The power at the top of the machine is transmitted to the spindle through three spur gears having a reduction of five to one. All of these gears are of steel with the exception of the large driving gear on the spindle, which is made of semi-steel. The feed is taken from the spindle, which runs at 100 r.p.m. and is of high carbon steel. Four different feeds, ranging from 0.01 to 0.03 in. per revolution of the drill, are obtained by manipulating a small lever on the feed change gear box, and a star lever which can be moved in or out controls the hand feed. In one position it works directly on the cross spindle and provides a quick approach and return for the spindle, while in the other it works through reduction gears to give the feed for hand feeding or drilling. The feed is tripped by a dial graduated to correspond with graduations on the spindle sleeve and having a lock that can be set to trip the feed automatically at any predetermined depth within a limit of 20 in.

The table, which is of the plain type with three slots planed from the solid, has a working surface 16 in. square and is surrounded by an oil trough 4 in. wide and 3 in. deep. The table has a vertical adjustment of 18 in. The distance between

the center of the spindle and the face of the column is 10 in. and that between the end of the spindle and the table is 32 in., the distance between the end of the spindle and the base being 18 in. more. The floor space occupied measures 25 x 59 in., and the net weight of the machine is approximately 3000 lb.

## A Two-Carriage Plain Turning Machine

A plain turning machine which is equipped with constant-speed pulley drive has been placed on the market by the Bridgeford Machine Tool Works, Rochester, N. Y. Among the features upon which emphasis is laid in the design of the machine are a small number of parts, simplicity and convenience in operation and the development of a compara-



A Recently Developed Plain Turning Machine That Can Be Equipped with One or Two Carriages.

tively large amount of power. Either one or two carriages can be supplied as may be desired by the purchaser.

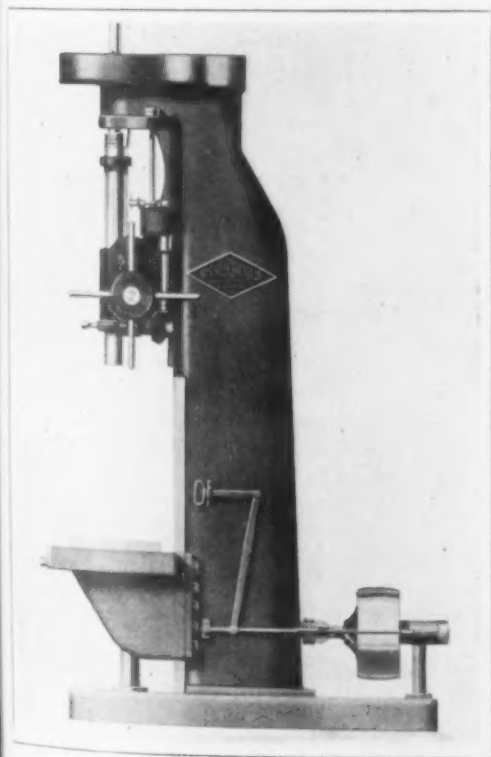
The machine is driven by a constant-speed pulley with the changes of speeds and feeds controlled by two levers at the front of the machine. If desired, motor drive can be substituted, in which case a 25-hp. motor is used. Steel is used for all the gearing throughout the lathe, that for the speed and feed changing mechanisms running in an oil bath. The face of the main driving gear is  $6\frac{1}{2}$  in., with the other gearing in proportion.

Three mechanical speed changes are secured through gearing, and this is doubled by the use of a two-speed countershaft. Each change of gear at the end of the lathe provides four feed changes through gearing.

The lathe has a swing of 27 in. over the ways and half that dimension over the carriages. Work up to a maximum of 8 ft. in length can be mounted between the centers.

The Interstate Commerce Commission, after an exhaustive investigation, has rendered a decision advancing express rates an average of 3.93c. per package on first-class shipments and 1.79c. on second-class shipments. All increases are limited to shipments which do not exceed 100 lb. in weight and above that limit no changes are authorized. The express companies in 1914 incurred a deficit of about \$2,500,000, and it is estimated that the new rates will net them a surplus of about that amount on a total business of approximately \$150,000,000 per annum. No one appeared before the commission in opposition to the proposed increase in rates. The new schedule becomes effective Sept. 1 and will continue in force for two years thereafter.

The Simmons Hardware Company, St. Louis, has reached a decision to take out a blanket insurance policy covering the lives of its nearly 4000 employees, the individual benefit averaging about \$1000 to each. The policy will cover every person on the payroll of the company so long as he remains in its employ, only formal resignation or discharge ending his right in the policy. The scheme will cost about \$40,000 in premiums annually. The plans and negotiations are in the hands of General Manager Oliver F. Richards.



A Box Column Type of Vertical Drilling Machine for Drilling High-Speed Drills up to a Maximum Diameter of  $2\frac{1}{2}$  In. in Steel

# Cranes for the Machine Shop and Foundry

## The Field of Usefulness of Overhead Traveling Bridge, Traveling and Stationary Jib and Monorail Cranes and Surface Transporters

BY H. M. LANE

The traveling crane in its various forms may be said to represent the engineer's greatest ally in cheapening production of many classes of equipment. Nevertheless, the improper installation of cranes or the improper selection of cranes may result in the serious handicap to a business. We will first confine our attention to cranes and hoists for use inside of the factory walls. Cranes of this type may be broadly divided into four classes.

1. There are traveling bridge cranes which span the entire bay of the factory and travel back and forth throughout its length. These cranes may

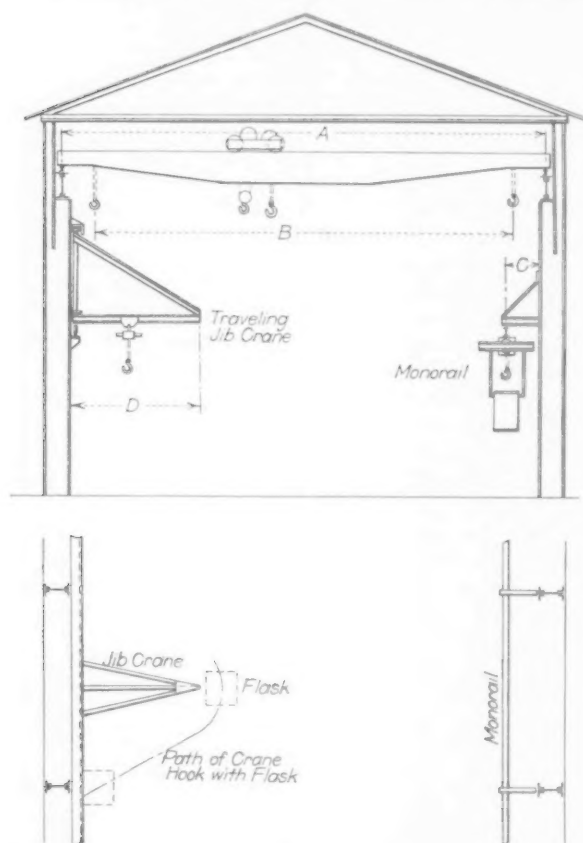


Fig. 1—Diagram Illustrating Relative Advantages of Bridge Traveling, Jib Traveling and Monorail Cranes

have one or more hooks, the latter being carried by one or two trolleys which move across the bridge.

2. There are traveling wall or jib cranes which project from one side of the plant and cover a limited space along the side in a manner similar to the traveling crane.

3. There are swinging jib cranes which are supported upon pivots top and bottom and cover all of the ground within a given circle.

4. There are monorail hoists or beam trolleys which travel in one direction only.

Each of these four types has its distinct advantages and disadvantages. In a moderate-sized building where the work can be done with one or at most two or three bridge-type traveling cranes, these will be found efficient, fairly rapid and very economical as to power consumed.

As the length of the building increases or the amount of work upon its floor increases so as to necessitate the installation of an increased number of bridge traveling cranes, we immediately encounter the factor of interference. When there is only one crane in the building we frequently find the men losing much time waiting for crane service. The introduction of more cranes may not overcome this loss of time on account of the fact that when it is desired to transport material along the length of the crane runway one crane may have to wait out of its way, so that it can proceed down the building. For a crane to travel approximately the entire length of the building necessitates driving all of the other cranes before it. In this case most of the crane men are usually idle and a considerable amount of power is consumed in traveling all the cranes to one end of the plant to make way for the one doing work. At the same time the men further up the floor may be waiting for crane service, even though the cranes are standing idle further down the plant.

Another serious problem which confronts us is the multiplication of cranes on one runway arising from the repair problem. When one crane burns out a motor and it becomes necessary to repair it the ordinary way is to run it as near one end of the plant as possible and shut it down, and this frequently locks up other cranes. Sometimes a trolley has to be repaired while the man remains in the cage operating the bridge travel motor to keep his crane out of the way of those engaged on each side of him. A practice of this kind means: in the first place a non-productive man in the crane cage; in the second place the use of electric current without accomplishing work, and in the third place a delay on the part of the repair men.

To overcome these repair difficulties some shops have been constructed with a crane hospital. This latter is simply a cross monitor provided with some means for lifting up one of the traveling cranes bodily so that the others may run under it. Usually the lifting device in a case of this kind consists of four heavy screws operated together. By means of these screws the disabled crane is hoisted into the hospital and repaired without interfering with the other cranes beneath it. This hospital overcomes one serious objection to placing a number of cranes on one runway but it does not overcome the delays resulting from crane interference.

The crane interference can be reduced to a minimum by a proper arrangement of work on the floor, but even then the transportation of material the full length of the shop cannot be accomplished without interference.

There are two overhead carrier systems which are frequently installed under the bridge traveling cranes for shifting work the length of the shop without interfering with the bridge cranes. These are the monorail and the traveling jib crane. Fig. 1 shows in plan and elevation the arrangement of the three systems. The travel of the crane hook of a traveling crane across the bridge is always

limited by the construction of the trolley and the larger and more powerful the crane the greater these limits. In other words, the distance of hook travel, *B*, across the shop is always less than the span, *A*, as shown in Fig. 1.

A monorail may be supported along one side of the shop, as shown at the right, the rail being placed at the distance *C* from the crane columns. It will readily be seen that under ordinary circumstances this distance *C* is largely lost space in ordinary crane service, so the monorail does not really cut off much of the active floor space available under the traveling crane. If the monorail be arranged without conductors outside of the monorail track, there is no danger of a short circuit from sling chains or crane hooks striking the monorail conductors. The monorail can be used for the distribution of material up and down the shop under the main traveling cranes. In this case each traveling crane becomes to a large extent localized and the interference of traveling bridge cranes is reduced to a minimum.

On account of the fact that the monorail has to be supported on brackets from the crane posts its carrying capacity is more limited than that of the bridge crane. Monorails, however, will carry loads up to 5 tons and this will be found sufficient for general distribution work in most foundries or machine shops.

The other type of overhead distribution service which can be installed under a traveling bridge crane, the traveling jib crane, is shown at the left in Fig. 1. The traveling jib crane can be used to serve machines along the wall and on account of the fact that it has two motions, in many cases would be much more useful than the monorail. It has one serious disadvantage in that the projecting jib may interfere seriously with the bridge traveling crane. The dot and dash lines in the plan show the course that the crane hook of the bridge crane would have to take in moving a load around the end of the traveling jib crane. The traveling jib cranes are sometimes wrecked by striking loads being carried on the traveling bridge cranes, and this constant risk in operating the two types on one floor is the most important point that has to be taken into consideration. There are cases, however, where the traveling jib crane will pay in spite of the additional hazard which it incurs.

The traveling jib crane is open to one of the objections already stated for the monorail, and that it is the fact that it extends as a cantilever or bracket supported at one end only and the length of the jib crane makes its capacity even more limited than that of the monorail.

Swinging jib cranes on posts along the side of the traveling bridge crane runway are open to the same objection as to carrying capacity and interference that apply to the traveling jib crane, except for the fact that the swinging jib crane will be forced out of the way if struck by a load carried by the traveling crane. The swinging jib crane, however, is so limited in its service area that it is only applicable for serving one or two machines in the machine shop or one or two molding pits in the foundry. Nevertheless, cranes of this kind are found exceedingly useful for setting cores in molds.

In the cases so far referred to it is presumed that the cranes or monorails are equipped with cages so that the man rides with his work. When we come to floor controlled hoists of any type we find them subject to a serious handicap in moving work. The floor control, however, is very efficient in the case of swinging jib cranes used for serving single machines or for setting cores in molds.

#### SPEEDS WITH CRANES

There are several very important matters in the original building plan which affect the speed of operation and the service which may be obtained from a crane of any type. In the case of the traveling bridge crane, a high-speed hoist involves the installation of a very heavy motor and this soon overloads the trolley, so we have to strike a happy medium and slow down the hoisting speed. In most cases the hoisting speed is less than 25 per cent of the bridge traveling speed and generally about 25 per cent of the bridge carriage or trolley traveling speed. In the case of some heavy cranes the hoisting speed is not more than 10 per cent of the bridge travel speed. This means that where work is being hoisted among obstructions that the two operations of lifting the load in the first place and lowering at the destination frequently occupy more time than the combined bridge and trolley travel. From this it is evident that a crane does not make an efficient elevator. If loads are to be handled to a considerable height a well-constructed elevator with a powerful motor will be found better than a crane.

Fig. 2 illustrates the cross section of a typical factory in which a crane serves several floors.

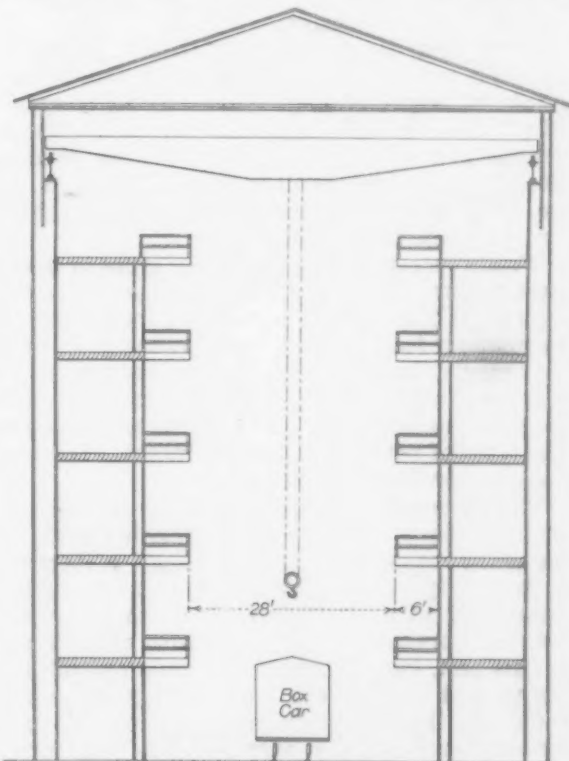


Fig. 2—The Crane as an Elevator, Showing Disadvantage of Long Swinging Ropes

When the length of the hanging ropes increases the difficulties arising from the swinging of the ropes and the attending difficulty of damping this swinging increase very rapidly. When the load is hanging only a few feet below the crane the bridge travel can be started rapidly without serious swinging, but when the load hangs 25 or 30 ft. below the crane the starting of the carriage in rapid motion will set the load swinging in a serious manner. Crane men become very expert in checking and overcoming the swinging action, but nevertheless much work is injured and many accidents result from having the crane runway too high.

Where multiple stories of a building are to be served with material which is within the capacity of a platform elevator, the latter will be found much more economical to maintain and operate.



The principal reason for this lies in the fact that we cannot install a sufficiently large hoisting plant on the carriage of our traveling crane without unduly increasing the size of the carriage, the bridge, the weight of the runway, and the strength of the supporting columns.

In many erecting shops two crane runways are installed, one high above the other. This system has a distinct advantage where high work is to be erected and it also makes possible the passing of work by one crane which is in service on the upper track over the lower track. The advantages gained, however, except in the case of high erecting shops, are not sufficient to pay for the additional investment, and the same results could be obtained much more simply with a combination of traveling cranes and monorails, or traveling cranes and surface transportation.

#### SURFACE TRANSPORTATION

In foundries surface transportation of the industrial railway type should be avoided as much as possible in all parts of the plant where molding sand or core sand is in use. The upkeep, that is the keeping of the tracks in clean, serviceable condition, becomes excessive in these departments, and the power necessary to move a given weight of material is also excessive.

Where a plant is equipped with a locomotive crane this may frequently be brought into the end or side of large buildings served by other cranes, and will be found advantageous for the delivery of material under the regular cranes or for handling material from one building to another. In this case, however, we have all the difficulty of surface transportation to contend with.

Within recent years a number of types of power-driven motor trucks have come into use for service in plants. These will be found very handy for transporting loads within their capacity between departments, but the objection is that where the loads are beyond a weight readily handled by men it becomes necessary to load and unload them with some form of power hoist, which means a traveling crane, monorail or jib crane.

The monorail for general service between departments is a form of transportation that has been much abused and rarely developed to its greatest possibility. The old standard type of monorail is equipped with a single hook so that the man traveling can carry but one load with him. Realizing this fact, two systems of multiple control have been worked out. In one there is only one control handled in the operator's cage, and two or more carriages are attached ahead of the cage like a train of cars. The operator throws the power on all of the hoists at one time, so that all loads can move together.

In the other systems there are two or more hooks arranged ahead of the cage and each provided with separate control handle so that the man can handle each hook, or he can work two hooks together. If in the latter case each hook is capable of carrying  $2\frac{1}{2}$  tons, he can pick up two loads, or with a porter bar or a double sling can pick up 5 tons by means of the two trolleys. With this type of monorail the number of trips necessary is cut down in proportion to the number of hooks employed on each machine, and the effective service of the equipment is greatly increased.

The monorail transportation system between departments possesses the advantage of not interfering with floor transportation, but the monorail is open to the same objection that applies to the bridge traveling crane, that is, if more than one

carriage is operating on a system there will be times when one carriage will have to get out of the way of the other. To a certain extent this may be overcome by the use of suitable loops and switches and by planning the work so as to localize the service of each monorail operator. For instance, one man may be stationed in the foundry delivering sand and supplies back and forth under the traveling cranes. Another man may have for his duty the delivery of cores or dry sand molds to the foundry and the third the serving of the cleaning department and the casting storage.

No crane system will ever reach its maximum efficiency without careful study as to a proper schedule of the work so as to have the smallest amount of lost time and to use a minimum amount of electric current. It is far better to have a crane or hoist standing idle a portion of the time, on account of the fact that it has accomplished all the work in the department and is waiting on the next operation, than it is to have two or more cranes tied up by one busy crane, particularly at a time when if they could jump over the busy crane, they could get busy themselves.

At times the control platform or stations can be so arranged that during a portion of the day a man runs one crane and during another portion another. The writer remembers one case in which the management of a factory discovered that at one time during the day the crane operator was idle approximately two hours. They installed a small core machine and drying oven up where he could get at it, and he made all the stock cores for the foundry, being paid at a small piece-work price for this extra work. In like manner there are many cases in which crane men can save other departments to good advantage.

#### Winchester Repeating Arms Company Pension System

The directors of the Winchester Repeating Arms Company, New Haven, Conn., announced last week the establishment of a pension system for its employees. It provides that male employees who have been continuously in the service of the company for at least twenty-five years and who have reached the age of sixty, and female employees of similar service who have reached the age of fifty-five, may be put upon the pension list at the company's discretion. Where the term of employment is thirty years or more, male employees aged fifty-five and female employees aged fifty will, on their own request, be retired and put on the pension list. The ordinary pension is to be based on the average annual pay in the five years next preceding the date when the employee is placed on the pension list and is to be at the rate of 1 per cent of such annual average pay for each full year of employment. At discretion the company may base the pension on the five consecutive years during which the employee has received his highest pay. The pension is to be at least \$20 a month. Pension payments are made only to employees receiving less than \$5,000 annually, but the company may vote a pension to persons receiving more than \$5,000 a year at not less than 25 per cent of the average annual pay in five years of continuous service in which the employee received his highest pay. The company reserves the right to waive temporary absences in deciding as to the term of continuous employment.

At the annual meeting of the D. Wilcox Mfg. Company, manufacturer of forgings, gears, etc., Mechanicsburg, Pa., held July 19, the following officers were elected: President and general manager, Frank E. Wilcox; vice-president, S. F. Hauck; secretary and treasurer, Mervin E. Anderson; directors, Frank E. Wilcox, S. F. Hauck, J. H. Koller, R. H. Thomas, Jr., O. C. Bishop, W. L. Hauck and B. G. Buser.

# Government Plans Large Outlays for Defense

Extensive Program Involving Many  
Millions for Army and Navy—Muni-  
tions to Be Called for on a Large Scale

WASHINGTON, D. C., July 27, 1915.—The Administration has suddenly become aroused to the necessity of putting the country in a better state of defense. The first formal announcement of the Government's purpose came in the shape of a bulletin issued at the White House July 24, stating that when the President returns from Cornish, N. H., in a few days he will hold a conference with the Secretaries of War and the Navy "to formulate a sane, reasonable and practical program of national defense." The announcement was apparently regarded as a signal that extreme reticence on this important subject is no longer required, and was immediately followed by semi-official statements that the War and Navy departments several weeks ago began the preparation of plans designed for the double purpose of meeting any emergency that may arise as the result of the European conflict, and of furnishing a broad basis for a new and more liberal military policy to be urged upon Congress at its coming session in December, if an extraordinary session is not sooner convened.

## THE POSSIBILITY OF WAR

It would be idle to say that the sudden activity of the Administration is not due to a feeling of apprehension lest the United States become embroiled in the war. There has undoubtedly been a great increase of tension since the President's last firm note to Germany, couched in unmistakable terms, was made public, and the situation has been rendered more critical by the cold reception accorded the note, as reflected in the comment of the German press, especially those newspapers which are commonly regarded as inspired by the Imperial Government.

It would be equally erroneous, however, to attribute the awakening of the Government entirely to the crisis that has developed during the past few days. Ever since the outbreak of the war American military and naval experts have been closely following developments at short range on both land and sea, and their technical reports, confirming and supplementing in elaborate detail the press reports received in this country, have convinced the authorities that our state of defense is hopelessly inadequate and our entire military establishment inferior to that of several fourth-class European powers.

These disclosures have finally stirred the President to a realization of the necessity of prompt and vigorous action, and the policy of silence and inaction heretofore pursued for the purpose of reassuring the country as to the danger of our becoming involved in the European war has been abandoned. Secretary Garrison and Secretary Daniels were recently directed by the President to take up the subject of the national defense and to lay before him at the earliest practicable moment complete projects for the increase of both army and navy and for the utilization of the manufacturing resources of the country that will serve as a basis for a vigorous recommendation to Congress involving, according to present indications, an increase of nearly 100 per cent in the average army and navy

appropriations of the past five years. That the acceptance by Congress of these estimates will entail radical and far-reaching changes in the fiscal policy of the Government, including the recasting of the revenue laws, goes without saying.

## IMPORTANT FACTORS UNDERESTIMATED

It has been with a certain sense of humiliation that the officials of the War and Navy departments have been forced to admit that this Government has woefully underestimated the importance of the three greatest factors in modern warfare as demonstrated by the great conflict in Europe, namely, the submarine, the aeroplane and the giant reserve store of ammunition for small arms, field artillery, siege guns and warships. The submarine is distinctly an American invention, yet the American navy is so far behind Germany and Great Britain in its adoption and development as to make it necessary for the Navy Department in the further expansion of this branch of the naval service to rely largely on technical information received from abroad. The value of the battleship, upon which we have placed the greatest reliance and to which we have devoted the larger part of our attention and our appropriations, has become problematical in view of recent performances of the submarine. The first thoroughly practicable flying machine was invented in the United States, but to-day half a dozen European nations possess larger corps of these most effective aircraft.

## GREAT SHORTAGE OF AMMUNITION

In no detail, however, has the hopeless inferiority of our military establishment been so clearly demonstrated as in the matter of stores of torpedoes, shells of various calibers for warships and land batteries, ammunition of various kinds and ability to replenish stocks in a sudden emergency. Wholly unprecedented demands for ammunition have been made in the present war by field artillery, in the use of which both Germany and France have made amazing strides as evidenced by the operations in French territory during the past three months. According to officially authenticated reports, the fighting forces of France and Germany in comparatively unimportant engagements have employed quantities of shrapnel and explosive shells that before the beginning of the present war were commonly regarded as sufficient to supply large armies for many weeks. The entire reserve stocks of the United States for offensive and defensive operations would hardly serve to keep the French and German batteries going a week.

It cannot be said that the United States is so far behind European countries in the development of guns for field artillery as in its capacity to supply them adequately with ammunition under existing appropriations, but even in the item of guns and their equipment, especially their carriages, France, if not Germany, has made progress that commands the admiration of ordnance experts. In the old style field artillery the rapidity of firing was limited to the ability of gun crews to replace the piece in position after each recoil. With recently devised



carriages the recoil is so taken up by the mechanism that the position of the carriage is not changed, and the gun is instantly ready to receive a new projectile. The result is a rapidity of fire and consequent discharge of quantities of ammunition, in recent operations in both the eastern and western theaters of war in Europe, that have surprised military experts and amazed laymen. The tremendous importance of possessing great quantities of ammunition both for small arms and field artillery has been impressively demonstrated in the case of the Russian armies which have lost tens if not hundreds of thousands of men mowed down by a fire which they were unable to return because they had neither cartridges for their rifles nor shells nor shrapnel for their field pieces.

#### MARKED INCREASE IN MUNITIONS CAPACITY

Ordnance experts do not disguise their satisfaction over the rapid development that has recently taken place in American factories engaged in supplying munitions of war for European consumption. Government plants, although exceedingly efficient and directed by the most accomplished experts, are comparatively small and their present productivity is limited by wholly inadequate appropriations. Every private plant added to the producing list is a potential auxiliary that can be called upon to co-operate with the Government in the event of hostilities. It is reliably stated that when the war broke out the Government shops constituted 50 per cent of the total American capacity for manufacturing field gun and small arms ammunition, while to-day the Government's share of the output is less than 20 per cent.

#### LARGE OUTLAYS TO BE MADE

The expenditures on behalf of the army and navy during the fiscal year just ended aggregated approximately \$270,000,000, of which \$142,000,000 was spent on the navy and \$128,000,000 on the army. A very large increase in these appropriations is contemplated by the program now being formulated. At least \$75,000,000 more will be asked for the army and probably a round \$100,000,000 for the navy. The army plans look to the building up of a fighting force of 500,000 men, regulars and militia, the latter to be directly under Federal authority. A proportionate increase in small arms and field artillery is contemplated, and money will be asked to provide adequate stores and reserves of ammunition of every description.

The naval program which is to be devised by the general board of the Navy Department will probably embrace four dreadnoughts, a number of battle cruisers, probably fifty submarines and a number of scout cruisers and auxiliary craft, including fuel ships, submarine tenders, machine shop repair ships, etc.

Co-operation between the army and navy will facilitate the development of the most successful types of aeroplanes and an appropriation will be sought that will permit the construction of as large a fleet as may be desirable. In this connection Congress will be asked to permit the War and Navy departments to use the largest possible discretion in the expenditure of the appropriations, and it is probable that Congress will not undertake to specify as closely as heretofore the exact object for which the money granted shall be expended.

#### REVENUE LEGISLATION IMPERATIVE

But whence will come the enormous sums necessary to meet these proposed expenditures? The producing capacity of the existing permanent tariff and internal revenue laws is about \$215,000,000

short of current requirements. If the army and navy are granted the increases that will be urgently recommended, this deficit will approximate \$400,000,000. The new fiscal year is less than a month old but a deficit of about \$17,000,000 has already accrued, as compared with a surplus of about \$6,000,000 on the corresponding date a year ago. That these conditions, taken in conjunction with the necessities of our military establishment as they have recently been developed, foreshadow a general overhauling of the tariff and internal revenue and the devising of extraordinary means of raising funds may be taken as a matter of course. Up to the present time Administration officials have been disposed to put off as long as possible the evil day when new revenue projects must be considered, but further delay is impossible and it may be assumed that when Congress meets a comprehensive scheme will be ready for transmission to the Ways and Means and Finance committees.

The probability of an extra session of Congress increases daily. Enormous emergency appropriations are urgently needed and will involve the early preparation and passage of special bills, rendering the money immediately available. The war revenue emergency act of October, 1914, which expires Jan. 1, next, must be continued and a joint resolution to this effect must be passed before the date of expiration. There is also a strong demand that Congress be called together to repeal the La Follette seamen's act. A powerful organization has been formed to restore sugar to the dutiable list of the tariff law, and this interest also is seeking the early convening of Congress.

The threatened strikes of machinists and other employees at the navy yards have been postponed to permit a conference between the President and representatives of the employees when Mr. Wilson returns to Washington. In the meantime a considerable number of machinists have been induced to leave the Government service by private concerns having large foreign contracts for war munitions. It is stated, however, that none of the Government plants has been in any degree crippled by this movement.

W. L. C.

#### Conference on Slag and Refuse Hauling

Officials of railroads in the Pittsburgh district met in the Chamber of Commerce rooms in that city July 21 with representatives of steel interests in Pittsburgh and the Mahoning and Shenango valleys to discuss the increase in rates for hauling slag and refuse recently submitted by the railroads to the public service commissions of Pennsylvania, Ohio and West Virginia. James A. Campbell, president Youngstown Sheet & Tube Company, spoke for the steel interests, and W. J. Hodgson, freight traffic manager of the Pennsylvania Lines West, spoke for the railroads. The carriers propose to increase the cost of hauling refuse from 25c. to 35c. per ton and to charge 20c. per ton for hauling slag. Mr. Campbell said that shippers are willing to pay 10c. per ton for hauling slag and let the present rate for hauling refuse stand. He said that the increase, if made effective, will be a hardship for companies getting ready to start operations after having been idle a year or more, as it would increase the cost of production of pig iron from 15c. to 20c. per ton. Representatives of the railroads retired from the meeting to discuss Mr. Campbell's proposition and on their return announced it rejected. The steel representatives then asked the railroads to refrain from filing the new tariffs with the Interstate Commerce Commission and also asked them to withdraw the new tariff on file with the public service commissions of the three States named above. The railroad interests refused to grant these requests. Another meeting of the steel interests and the railroads is expected to be held in about two weeks.



## MAY FOREIGN IRON TRADE

Tonnage Exports Increase 90 Per Cent Over 1914  
—Imports About 3 Per Cent More Than 1914

Complete figures for our May foreign trade in iron and steel are now available. A preliminary statement of exports in that month was printed in THE IRON AGE of July 8. The report of the Bureau of Foreign and Domestic Commerce for the month of May shows a marked increase in the quantity and value of the tonnage exports of iron and steel as compared with the previous year. While the tonnage exports in April were the highest since July, 1913, May surpassed this record, the last month in which the May tonnage figures were exceeded being August, 1912. The value of the exports of iron and steel and the manufactures thereof was \$26,536,612, against \$19,734,045 in May, 1914. The imports of similar commodities were valued at \$2,098,445 in May, 1915, while for the same month of 1914 the amount was \$2,836,170. The value of these exports in the eleven months ended with May was \$194,131,255, against \$232,552,719 for the corresponding period of 1914. The import figures were \$20,709,426 and \$28,557,41 respectively.

Imports for which quantities are given amounted to 28,917 gross tons, against 16,569 tons in April, 8054 tons in March, 7505 tons in February and 28,175 tons in May, 1914. This is in direct contrast to the previous month, when the imports were approximately half those of the previous year. This increase was in two commodities only, scrap iron and steel rails, the last increasing from 2189 tons in 1914 to 13,434 tons this year. As was the case in April structural iron and steel declined materially, but was surpassed by tin and terne plates which decreased from 2668 tons in 1914 to 24 tons in 1915.

Details of the imports of tonnage commodities in May and the eleven months ended with May, as compared with the corresponding periods of the previous fiscal year, are as follows:

## Imports of Iron and Steel

	May		Eleven Months	
	1915, Gross Tons	1914, Gross Tons	1915, Gross Tons	1914, Gross Tons
Pig iron (including ferro-silicon) .....	593	678	6,222	*38,892
Ferro-silicon .....				†3,326
All other pig iron .....	10,816	16,504	93,860	†84,586
Scrap .....	2,221	997	29,834	29,656
Bar iron .....	233	854	9,620	20,204
Structural iron and steel ..	19	573	5,525	9,925
Hoop or band iron .....			648	
Billets, blooms and steel ..				
billets .....	813		22,060	*6,317
steel billets without alloys ..	195	90	1,767	†3,380
All other steel billets .....		2,494		†24,346
Steel rails .....	13,434	2,189	38,046	14,709
Sheets and plates .....	82	464	2,463	2,855
Tin and terne plates .....	24	2,668	4,676	21,641
Wire rods .....	487	662	4,340	10,864
Totals .....	28,917	28,173	218,413	270,701

\*Figures cover period July 1, 1913, to Oct. 3, 1913, inclusive.

†Figures cover period beginning Oct. 4, 1913.

The tonnage of exports for which quantities are given was the highest since August, 1912, when 282,836 gross tons of iron and steel and manufactures thereof were shipped to foreign countries. The total for May, 263,736 tons, is approximately 18 per cent more than the figure for April, which was 223,242 tons. The increase in April was about 28 per cent as compared with March which, in turn, was approximately 20.4 per cent ahead of February. As compared with May, 1914, the increase in exports was about 90 per cent. The totals are: May, 1914, 138,656 gross tons; February, 1915, 144,553 tons; March, 174,269 tons; April, 223,242 tons, and May, 263,736 tons. This last figure approaches very nearly the rate for April, 1912, which was 267,210 tons. The increase was general and was most noticeable in the case of billets and barb wire. Although the exports of billets amounted to 37,260 tons, an increase of 268 per cent over May, 1914, they fell short of the April figure of 41,321 tons. The exports of barb wire were 19,521 tons, as compared with 5367 tons in May, 1914, and 16,721 tons in April, 1915.

The greatest falling off was in railroad spikes with steel sheets next. The total value of the iron and steel exports for which tonnages are given was \$9,720,372, against \$5,637,981 in May, 1914. The average value per ton for the two months was \$36.85 and \$40.66 respectively, against \$40.16 for April, 1915.

Details of the exports of these tonnage commodities in May and the eleven months ended with May, compared with the corresponding periods of the previous fiscal year, are as follows:

## Exports of Iron and Steel

	May		Eleven Months	
	1915, Gross Tons	1914, Gross Tons	1915, Gross Tons	1914, Gross Tons
Pig iron .....	18,581	11,726	108,483	189,101
Scrap .....	1,050	3,411	22,550	66,684
Bar iron .....	2,394	359	10,072	9,922
Wire rods .....	11,236	6,321	80,303	44,117
Steel bars .....	37,260	10,151	176,375	137,979
Billets, ingots and blooms, n.e.s. ....	48,391	6,872	171,417	41,800
Bolts and nuts .....	1,272	1,401	12,019	18,491
Hoops and bands .....	1,578	968	13,088	10,763
Horseshoes .....	865	122	10,061	1,177
Cut nails .....	376	661	2,227	4,174
Railroad spikes .....	264	1,075	4,883	7,872
Wire nails .....	6,459	2,363	45,291	33,556
All other nails, including tacks .....	726	311	4,189	2,958
Pipes and fittings .....		16,355		222,761
Cast pipes and fittings ..	6,393		57,334	
Wrought pipes and fittings ..	15,787		102,631	
Radiators and cast-iron house heating boilers .....	144	358	2,463	5,134
Steel rails .....	16,646	15,659	122,040	325,452
Galvanized-iron sheets and plates .....	6,446	2,851	45,042	50,166
All other iron sheets and plates .....	1,348	805	8,286	10,430
Steel plates .....	16,333	8,462	102,081	151,289
Steel sheets .....	10,122	16,559	87,344	134,461
Structural iron and steel .....	14,072	14,772	145,812	280,449
Tin and terne plates ..	7,307	4,695	72,428	40,093
Barb wire .....	19,521	5,337	124,804	73,051
All other wire .....	19,165	7,062	119,047	77,420
Totals .....	263,736	138,656	1,650,270	1,939,300

Imports of iron ore in May amounted to 98,974 tons, as compared with 91,561 tons in April, 88,402 tons in March, 78,773 tons in February and 125,659 tons in May, 1914. For the eleven months ended with May, 1,075,539 tons was imported against 1,979,015 tons in the same portion of the last fiscal year.

## Machinists' Eight-Hour Demands in the East

Following the conclusion of arrangements with the Remington Arms Company under which an eight-hour day goes into effect at its plants at Bridgeport, Conn., the officers of the International Association of Machinists have announced in the past week that demands for the eight-hour day would be pushed in a number of other shops in New England. The unions withdrew their demand for a recognition of millwrights as metal workers by the Remington companies. The Remington shops have put in force a schedule calling for eight and one-half hours' work per day in the first five days of the week and five and one-half hours on Saturday. It is stated that the machinists' strike resulted in better hours of work for non-union employees as well as members of the union at the Remington plants. Early this week machinists, millwrights and structural workers at the Remington and several sub-contracting plants resumed their strike, giving as the reason that some department heads refused to take back all the men who had been on strike in the preceding week.

Transferring the scene of their operations temporarily to the New York district, the vice-president and various business agents of the International Association of Machinists presented a demand to the E. W. Bliss Company, Brooklyn, this week for an eight-hour day and a large increase in the minimum wage. The plant of this company has been engaged for some time on torpedoes for the Government and on munitions for Europe. The union's representatives announced that they would make similar demands upon other machine shops in the metropolitan district, particularly those having war contracts.

The Erie Malleable Iron Company, Erie, Pa., will build an extension to its plant, 128 x 277 ft., of brick, steel and concrete construction.

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# THE IRON AGE

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## Steps Toward Preparedness

A wide field for interesting speculation is opened up by the action of the French Government in requiring the registration of all manufacturing plants capable of use in the production of war munitions. This mobilization of industries, taken in connection with our own admitted unpreparedness for military operations, either offensive or defensive, has suggested the desirability of the adoption in this country of measures looking to the prompt expansion of the capacity of our public and private plants to meet the existing emergency and the preservation of their facilities for use after the present occasion has passed. A recent suggestion that has been the subject of some comment involves provision by Congress to lease and store against future necessity machinery in private plants constructed for the manufacture of artillery, small arms, and ammunition of all calibers. It is proposed that when such machinery is no longer required to meet the present extraordinary demand, it shall not be dismantled or adapted to other use, but shall be preserved intact, the Government taking it over and carrying it on a basis of compensation to the owners that would represent a reasonable return on the capital invested.

These interesting proposals have been carefully examined by the War Department officials at Washington. Experts see in the action of the French Government the logical outcome of a condition that is well nigh desperate, when every available fighting man is in the ranks and all the manufacturing resources of the country must be utilized to keep him at his deadly work. It is, of course, extremely improbable that the Government at Washington would ever be reduced to such a stern necessity. The proposed storage of machinery is not indorsed by our experts because very little of it is adapted exclusively to the production of war material and that which can be used for no other purpose would almost certainly become antiquated in the period which naturally would elapse between emergencies requiring its use.

Inspection of the hearings upon military appropriation bills pending in recent Congresses discloses the fact that General Crozier, the accomplished chief of the Ordnance Bureau of the War Department, some years ago devised a project for developing the resources of the country for the

production of war material on a large scale on the shortest possible notice. False notions of economy, political considerations, and the pandering to organized labor have stood in the way of this project which to-day exists only in the germ but which, in view of the present emergency, may be rapidly developed if sane counsels prevail in Congress. General Crozier's plan, in brief, has been the substantial enlargement of the manufacturing facilities of the arsenals, but the restriction of actual production by the Government to a minimum sufficient to maintain buildings and machinery in a high state of efficiency and the purchase by contract from private establishments of the great bulk of the requirements in the shape of guns, ammunition, etc. With adequate appropriations it would be possible in the execution of this policy to develop the expansibility of the arsenal plants to a point where, by the use of two or three shifts of workmen, the producing capacity could be increased enormously and thus the Government in any sharp emergency would be in position to turn out great quantities of material without the delay necessary to construct new buildings and equip them with machinery. Under these conditions the War Department, in time of peace, would actually produce but a relatively small proportion of the war material currently needed, but by purchasing its supplies under contract it would enable private manufacturers to keep their munitions plants in running order ready to co-operate with the Government establishments whenever called upon to do so.

This far-sighted policy, unfortunately, has not appealed strongly to Congress. The very demonstrated efficiency of the ordnance shops as developed by General Crozier and his aids has militated against the adoption of the recommendations of the chief ordnance officer. The ability of the Government to produce guns and ammunition at less than the market price has been thought an unanswerable argument against the plan for purchasing war material from private contractors. If a fuse can be made at the arsenals for \$1.50, the average Congressman has been unable to see why the Government should buy fuses in the open market at a higher price, especially when the production of the full requirement of these devices in the Government shops would furnish more jobs for political constituents.

The more the problem is studied the deeper be-

comes the conviction that Congress alone is responsible for the lamentable conditions now existing. It is to be earnestly hoped that the present emergency will at least induce our law makers to abandon a short-sighted policy that has brought us nothing but humiliation.

### No New Steel Consolidation

Having been in retirement for several years, in the pendency of the suit to dissolve the Steel Corporation, the story of a second consolidation to include the leading independent steel companies was given wings once more in the past week. Telegraphed from Cleveland, the center of the iron ore trade, and touched with verisimilitude by the use of names of well known steel manufacturers in proper connection with their respective companies, the report went to every quarter of the country. The juxtaposition of the Bethlehem and Crucible Steel companies in a single article would have been enough of itself, with the speculative fever at its height, to make a new appeal to imaginations already under the spell of war millions. But to these two, which Wall Street lately has been making newly famous, were added the names of seven independent steel companies with no particular war records, the whole representing a total, as the article has it, of \$540,500,000 (par value) of bonds and stocks in existing security issues.

As long as the legality of the Steel Corporation is in question in the country's highest court, no such consolidation will be seriously thought of by steel manufacturers. It is highly improbable that the nine companies named—the Bethlehem, Colorado, Lackawanna, Republic, Jones & Laughlin, Crucible, Pennsylvania, Cambria and Youngstown Sheet & Tube—could ever be gathered into one. Without dissent heads of these companies, as fast as they have been reached by newspaper inquiry, have said that the Cleveland report had no foundation. The fact that the Steel Corporation and these nine companies represent together 90 to 95 per cent of the country's output of steel ingots is sufficient reason for saying that apart from all court decisions, public sentiment would not tolerate a second Colossus in the steel trade. So far as the export trade is concerned, on which the decision upholding the Steel Corporation was so largely based, co-operation without integration is now apparently in sight as a method, under Government sanction, of extending abroad the trade of the independent manufacturers of steel.

### The Basis of the Steel Trade's Prosperity

Since it has become an assured fact in recent weeks that the steel trade of the United States has entered upon a period of real prosperity it becomes interesting to reflect upon the causes which have produced the prosperity and to speculate upon the probable intensity and duration of this prosperity.

By no means an uncommon view is that the present prosperity of the steel trade has been caused chiefly by the European war. To discuss intelligently the war influence it is necessary to subdivide. By the war giving the United States a larger merchandise trade balance the country may

be made more prosperous, whereby domestic consumers would buy more freely. By shutting off some of the iron and steel exports of belligerent countries the war may give the United States increased trade with neutral countries. By buying foodstuffs, clothing, etc., heavily in the United States the war may cause an expansion in facilities for manufacturing such goods, causing more or less demand for iron and steel in the erection and equipment of factories. By buying ammunition, arms, motor trucks, railroad equipment, etc., in the United States, the belligerents may increase the demand upon the steel mills, while finally they may buy steel directly from the mills, in the form of billets, sheet bars, rails, large steel rounds, plain and barb wire, etc. Such purchases may again be subdivided, some, like those of billets, being made simply because supplies from Belgium and Germany have been shut off, while others, like large steel rounds and barb wire, are bought for use in war.

To secure a quantitative view these different classes of demand may be analyzed. The increase in general prosperity which may be falling to the United States through the large trade balance it is desirable to reserve for discussion later. As to iron and steel exports to neutral countries, the statistics show quite clearly that practically up to date this trade is not nearly so large as it was in 1912 and 1913. Quite recently, as indicated in THE IRON AGE last week, the imports of neutral and non-producing countries appeared to be at the rate of only about 1,200,000 tons a year from the United States and 1,500,000 tons from Great Britain, a total of 2,700,000 tons, against close to 10,000,000 tons in years immediately preceding the war. At this moment our exports may be running a trifle heavier, but they are not up to our average movement to the same markets in the past. If the neutral countries are eventually and during the war to buy steel at a rate somewhat comparable with the old rate, that will make additional prosperity for the American steel trade, but up to date the buying of neutrals is light, and the American steel trade suffers, rather than benefits, by the change the war has made in this direction.

As to the business in foodstuffs, clothing etc., for the belligerents, the quantitative analysis shows that the benefit to the steel trade has not been appreciable. If manufacturing facilities had to be expanded largely to meet such requirements the effect would be felt first of all in the structural steel trade, and very promptly indeed, yet it is readily observed that in the general steel improvement structural steel has occupied an unenviable place far down in the list.

As to purchases by the belligerents of commodities made largely from steel, there is no doubt that such buying has given the steel industry considerable business. The most conspicuous item from a tonnage standpoint is steel rounds, but seeing that these are being exported as well as sold to domestic makers of shells, and noting that it is physically impossible for the steel industry to turn any very unusual proportion of its steel ingot output into steel rounds, it is evident that the new demand in this quarter cannot exceed a very small per cent of the total steel output. As to motor trucks, it is known that the sales of passenger and commercial



cars to domestic consumers have made a new record in the past season, so that the steel used in exported cars can be no very large part of the automobile industry's total consumption. A corresponding comparison can be made in freight cars. Since May 1 the domestic roads have ordered 35,000 to 40,000 freight cars, while the export orders have totaled about 21,000 cars, showing that domestic buying is chiefly responsible for the present activity in car building.

As to direct exports of iron and steel, a moderate amount of pig iron is going to Italy and of unfinished steel to England, caused by the shutting off of the usual supplies. From a scrutiny of the May export figures for tonnage items (which the Government puts out as only approximate) a rough guess would be that in that month the exports to the belligerent countries were at the rate of say 1,600,000 to 1,700,000 tons a year, of which about three-fifths was unfinished and finished material purchased because supplies from Belgium and Germany were shut off, and about two-fifths was war material, chiefly barb wire and large steel rounds.

From this analysis the conclusion seems justifiable that the total war demand of all descriptions does not at the moment amount to as much as 20 per cent of the current steel output, while it must be remembered that the exports of steel to neutral and non-producing countries are much less than they were the last time the American steel trade was prosperous, in 1912 and 1913.

That the war may have contributed to making the country more prosperous, by furnishing a very large merchandise trade balance, is true in a sense. We are more prosperous, with the war going on, when we have a large trade balance, than we should be if we did not have the trade balance, but it does not follow that we are nearly as prosperous as we should be if there were no war and we had our ordinary trade balance. In any event, the trade balance is not a temporary influence. It is something that has made the country stronger, and that strength will be shown more in the future than it is being shown at present.

Comparing last December with the present, the production of steel appears to have been multiplied by about two and one-half, the increase being therefore equal to three-fifths of the present production. At the outside, the war would account for not more than one-fifth, leaving two-fifths to be found elsewhere. The steel trade has its alternating periods of activity and dullness. According to the general rhythm of the movement, a recovery was due in 1914, and just before the war there were many competent observers who believed that the trade was then on the eve of such a recovery. It is a reasonable hypothesis that the war at its outset throttled the tendency of the trade to improve, but that as it progressed it furnished enough favorable influences to offset partially its unfavorable influences, and thus the steel trade was permitted to enter upon a healthy and normal course of recovery.

The steel trade's present prosperity, from this analysis, is not due to the war but is in spite of the war. As to the future, it is reasonable to conclude that the present war demand will continue while the war lasts, and that upon the conclusion of the war the domestic demand for steel will easily

take care of itself, the one important thing being for the United States to fortify itself with a reasonable tariff. After the war the present belligerents will be able to restore their production of iron and steel more rapidly than they can resume consuming, and we shall be sadly exposed if we do not have an adequate tariff. Meanwhile, during the war, it is certain that the demand upon us for steel for neutral countries will increase, and it may reach very important proportions. It cannot decrease to our injury, for it has amounted to hardly anything thus far.

### A Proposal That the Government Lease Weapon-Making Machinery

H. E. Field, president Wheeling Mold & Foundry Company, Wheeling, W. Va., in sending to THE IRON AGE a copy of a communication recently published in the *New York Times*, written by B. W. Peterson, president Dollar Savings & Trust Company, Wheeling, in regard to weapon-making tools says: "I think this is a very good suggestion and one which should receive consideration in all our trade papers." Mr. Peterson's letter to the *Times* is as follows:

Experience has clearly demonstrated the wisdom of the modern policy of manufacturers to develop and increase their capacity for production rather than to carry large stocks of manufactured goods.

While it is hoped this nation shall have the minimum necessity for ammunition in the future, the possibility of its being needed, sooner or later, confronts us and must be seriously considered if we are to gain wisdom from the crying demand on us by European countries for munitions to carry on their fight for life.

In the light of these circumstances, it seems to me that every machine or device in the hands of our manufacturers now, or that hereafter may be engaged in the production of the implements of war or ammunition should, when the demand for their product is past, be carefully stored and preserved for our own use when needed and not dismantled or adapted to other uses. With this equipment at command we could safely carry a comparatively small stock of war materials for defense, because, when any international trouble was brewing that directly concerned us, we could summon to almost instant activity the full capacity of this machinery to supply the materials for our defenders.

This could be accomplished by Congress, at its coming session, making provision to lease and safely store such of these outfits as may be deemed expedient at a fair rental on their worth as machinery, to be appraised by a commission of United States Army and Navy officers, with options to purchase at any time at appraised values. Our Government to have privilege to cancel any or all leases on one year's notice.

This provision for our national defense would certainly cost us less than the interest and storage on the stock of arms and ammunition which otherwise it would be advisable for us to carry.

Mr. Peterson's suggestion may have been intended to apply chiefly to equipment for the manufacture of arms. In the case of lathes and other machine tools, as well as of forging presses, which are employed in the manufacture of shells, such equipment being part of the regular outfit of many companies would find employment when the pressure of war demand is released. The fact is to be considered, however, that scores of establishments have bought large numbers of machines which could not be kept busy on the lines of work usual to them.

It is of interest to note in this connection that the French Government has required all owners of metal working lathes and hydraulic presses, as well as of steam hammers weighing more than two tons, to file lists of such equipment with its ordnance bureau, so that the manufacture of munitions at home may be increased and purchases from other countries be curtailed.

The Ashland Iron & Mining Company, Ashland, Ky., will blow in one of its two blast furnaces within a few days.

## STEEL CORPORATION EARNINGS

Surplus for June Quarter, \$8,267,645, Making  
Surplus for Half-Year \$2,877,784

The United States Steel Corporation's statement for the quarter ended June 30, issued on Tuesday, shows net earnings of \$27,950,055, against net earnings of only \$12,457,809 in the first quarter of the year and \$20,457,596 in the April-June quarter of 1914. The earnings are the largest in any quarter since the third quarter of 1913. The statement is as follows, in comparison with the second quarter of 1914:

	1915	1914
April	\$7,286,409	\$6,920,879
May	9,320,576	6,845,823
June	11,343,070	6,690,894
Total earnings after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants and interest on bonds of the subsidiary companies	27,950,055	20,457,596
Less charges and allowances for depreciation:		
Sinking funds on bonds of subsidiary companies and depreciation and extraordinary replacement funds	6,031,013	5,613,007
Sinking funds on U. S. Steel Corporation bonds	1,607,458	1,546,961
Net income	20,311,584	13,297,628
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	5,493,884	5,571,142
Premium payable on bonds redeemable under sinking funds	245,136	227,023
Balance	14,572,564	7,499,463
Deduct dividends for the quarter on stocks of the United States Steel Corporation:		
Preferred	6,304,919	6,304,919
Common		6,353,781
Deficit for the quarter		\$5,159,237
Surplus for the quarter	\$8,267,645	

The regular quarterly dividend of 1% per cent on the preferred stock was declared. The common stock dividend was again passed.

As the deficit for the January-March quarter was \$5,389,861, it will be seen that the great increase in earnings in the quarter just ended enables a surplus of \$2,877,784 to be shown for the half-year, against a deficit of \$11,448,881 in the corresponding period of 1914.

## Republic Company's Half Year

The Republic Iron & Steel Company has issued its semi-annual report for the six months ended June 30, 1915. The income account compares as follows:

	1915	1914
Net earnings from operations	*\$1,771,697	\$1,316,731
Interest and dividends from investments	28,357	5,100
Total profits	\$1,800,053	\$1,321,831
Depreciation, etc.	\$263,839	\$178,882
Exhaustion of minerals	101,128	109,285
Total deductions	\$364,966	\$288,167
Net profits	\$1,435,087	\$1,033,664
Interest	427,583	414,888
Surplus	\$1,007,504	\$618,776
Preferred dividends		875,000
Surplus	\$1,007,504	\$256,224
Previous surplus	6,615,290	6,512,778
Total surplus	\$7,622,793	\$6,256,553

\*After deducting charges for maintenance and repairs amounting to \$673,495 for 1915 and \$742,100 for 1914.

†Deficit.

In his accompanying remarks to stockholders Chairman John A. Topping says:

"The gradual improvement in demand and earnings anticipated by the annual report of Dec. 31, 1914, was about as expected, the change occurring in January continuing throughout the period; the largest gain in profits, however, was made in the second quarter.

"One of the gratifying features of operations for the period under review is that net earnings applicable to dividends were approximately 62 per cent in excess of the earnings for the corresponding period ended June 30, 1914, although the price of products sold during the current semi-annual period averaged approximately 6

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per cent lower than prices realized during the semi-annual period ended June 30, 1914, the increase in profits being due to some increase in tonnage, but more largely to benefits accruing from improvements, economy and efficiency in manufacturing, labor rates for the period not having been reduced.

"The net profits applicable to dividends for the six months' period ended June 30, 1915, after deducting depreciation and all other charges, were \$1,007,503. The balance of net quick assets as of June 30, 1915, now stands at \$12,474,362."

The Pittsburgh & Conneaut Dock Company, a subsidiary of the United States Steel Corporation, is planning to enlarge its ore-handling facilities at Conneaut, Ohio, by the installation of two unloaders equipped with fifteen-ton buckets. It is understood that the order will be placed for a Hulett type of machine built by the Wellman-Seaver-Morgan Company, Cleveland. At present nine large unloaders and twelve small ones are operated by the dock company, having a daily capacity of 60,000 tons.

The hearing on the complaint of the Buffalo Union Furnace Company and the Wickwire Steel Company against the Buffalo & Susquehanna Railroad Company and a number of other lines, was resumed at Buffalo July 27, before August J. Gutheim, special examiner of the Interstate Commerce Commission. Samuel A. Kennedy of Chicago, a coke expert, was examined at length.

The new Philadelphia office of the U. S. Expansion Bolt Company is located at 40 North Sixth Street instead of 42 North Seventh Street, as was stated in THE IRON AGE of July 22. The main office of the company is located at 48 Dey Street, New York City.

# The Iron and Metal Markets

## BAR ORDERS FOR FRANCE

### The Leading Feature in Finished Steel

#### Semi-Finished Steel Higher—Steel Corporation's Larger Scale of Operation

The Steel Corporation's report of larger earnings than were expected for the second quarter, particularly the high rate of \$11,343,000 reached in June, has given a new measure of the steel trade's prosperity. That profits went up sharply in the second half of June tallies with other facts showing how rapidly the recent improvement came.

The market developments of the week have been equally stirring. In new business the leading item is a total of 220,000 tons of bars placed by a Cleveland interest for shipment to France, bringing the total on this account up to 350,000 tons, which has been divided between the Steel Corporation and the Lackawanna Steel Company. An additional 100,000 tons will be placed for delivery in the next six months if prices and deliveries can be arranged. France is also in the market for shell forgings for more than 1,100,000 shells, 6-in. to 11-in., to be delivered at the rate of 6000 a day.

Other definite bar requirements for munitions, now before the trade, both for export and for domestic plants, amount to 100,000 tons. Prices of shrapnel rounds have advanced, and while 1.50c. was done on contracts early in the war 2.75c. to 3c. is now quoted, and sales have been made as high as 3.5c.

It is now estimated that 20 to 25 per cent of the current output of leading steel companies is represented in war materials. The increased rate of output is seen in a 93 per cent ingot schedule for Steel Corporation plants against 91 per cent in the previous week. Five more Steel Corporation blast furnaces have started up, making an 87 per cent pig-iron operation.

There has been some further shipment of steel from Chicago to the Pittsburgh district. A new departure is seen in plans for the rolling of a large tonnage of export rounds on the rail mill at Ensley.

Semi-finished steel has advanced rapidly in the East, as foreign inquiry has increased. Considerable shipments have been made to France and Great Britain. At Philadelphia \$30 to \$32 has been paid for rerolling billets and sales by eastern Pennsylvania steel companies are reported at even higher prices. The scarcity of billets has evidently taken some consumers unawares. At Youngstown billets and steel bars for prompt shipment have sold as high as \$23.

The ferromanganese situation is causing more concern as steel production grows. Great Britain has put in force a new restriction on exports. Our London cable reports a Government order just issued to producers of ferromanganese to hold three months' output in stock, also three months' ore re-

quirements, and consumers there are directed to hold a three months' stock of the alloy in reserve as long as the war lasts. One British producer is unable to make exports owing to scarcity of ore. Imports of ferromanganese to the United States have been only 21,000 tons in the first half of the year whereas the six months' average for the past five years was 50,000 tons.

Manganese ore imports in June were 31,000 tons, against a total of 27,000 tons for the preceding five months of the year. As bearing on ferromanganese prices and supplies, the contrast between these imports of 58,000 tons of the ore in the half year, and a half-year average of 135,000 tons in the preceding five years is significant.

Buying of track supplies has been out of all proportion to the buying of rails, showing that the railroads are eking out with their old rails. Some companies heavily loaded with bar business would be put to it to deliver any large amount of rails to be put in track this season. There is still before the mills a 20,000-ton rail inquiry from the Italian State Railways. Russia's rail orders, of which presumably 200,000 tons have been placed here, are still complicated by questions of terms.

There is some turning to bar iron in place of steel in the congestion of war orders for the latter. Reinforcing bars plainly have not shared in the strength of the general bar market.

The galvanized sheet trade is easier, as some producers who bought spelter at lower levels are making greater efforts to market their product. The substitution of black sheets for galvanized has not made marked headway.

The heavy demand for open-hearth steel so far dominates the market that prices are sustained on some finished products for which consumption has not increased. In the Central West and at Chicago plates lag behind the 1.30c., Pittsburgh, schedule for the three heavy products, while in the East plates are firmer than structural material.

Pig iron is firmer, as higher levels are established in steel lines. In Southern iron the \$10 minimum for No. 2 is becoming more general.

## A Comparison of Prices

### Advances Over the Previous Week in Heavy Type Declines in Italics

At date, one week, one month and one year previous	July 28, July 21, June 30, July 23,			
	1915.	1915.	1915.	1914.
<b>Pig Iron, Per Gross Ton:</b>				
No. 2 X, Philadelphia...	\$14.50	\$14.25	\$14.25	\$14.75
No. 2, Valley furnace...	12.75	12.75	12.50	13.00
No. 2, Southern, Cin'ti...	12.00	12.65	12.65	13.25
No. 2, Birmingham, Ala.	10.00	9.75	9.75	10.00
No. 2, furnace, Chicago*	13.00	13.00	13.00	13.75
Basic, del'd, eastern Pa.	14.00	14.00	13.75	14.00
Basic, Valley furnace...	13.00	13.00	12.65	13.00
Bessemer, Pittsburgh...	15.20	14.95	14.70	14.90
Malleable Bess., Ch'go*	13.00	13.00	13.00	14.00
Gray forge, Pittsburgh...	13.45	13.45	13.35	13.65
L. S. charcoal, Chicago...	15.75	15.75	15.75	15.75

<b>Billets, etc. Per Gross Ton:</b>				
Bess. billets, Pittsburgh...	22.00	22.00	21.00	19.00
O.-h. billets, Pittsburgh...	22.00	22.00	21.00	19.00
O.-h. sheet bars, P'gh...	23.00	23.00	22.00	19.50
Forging billets, P'gh...	28.00	28.00	27.00	25.00
O.-h. billets, Phila....	30.00	24.56	22.02	21.90
Wire rods, Pittsburgh...	26.00	25.50	25.00	24.50

\*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.



July 29, 1915

July 28, 1915.	July 21, 1915.	June 30, 1915.	July 29, 1914.
Cents.	Cents.	Cents.	Cents.
<b>Wires, Nails and Wire,</b>			
Per lb. to Large Buyers:			
Sheets, black, No. 28, P'gh.	1.75	1.75	1.80
Galv. sheets, No. 28, P'gh.	1.60	1.60	1.55
Wire nails, Pittsburgh.	1.55	1.55	1.55
Cut nails, Pittsburgh.	1.40	1.40	1.35
Fence wire, base, P'gh.	2.50	2.40	2.40
Barb wire, galv., P'gh.			1.95

**Finished Iron and Steel,**

Per lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.	1.30	1.22 1/2	1.22 1/2	1.17 1/2
Iron bars, Pittsburgh.	1.25	1.25	1.25	1.15
Iron bars, Chicago.	1.20	1.20	1.20	1.05
Steel bars, Pittsburgh.	1.25	1.25	1.25	1.15
Steel bars, New York.	1.40	1.419	1.419	1.31
Tank plates, Pittsburgh.	1.25	1.25	1.20	1.10
Tank plates, New York.	1.369	1.369	1.369	1.26
Beams, etc., Pittsburgh.	1.25	1.25	1.20	1.15
Beams, etc., New York.	1.419	1.419	1.369	1.26
Strip, grooved steel, P'gh	1.25	1.20	1.15	1.15
Strip, sheared steel, P'gh	1.30	1.25	1.20	1.20
Steel hoops, Pittsburgh.	1.30	1.30	1.30	1.20

**Metals,**

Lake copper, New York.	22.00	22.00	22.50	13.37 1/2
Electrolytic copper, N. Y.	18.50	19.00	20.00	13.00
Spelter, St. Louis.	18.00	20.00	21.00	4.95
Spelter, New York.	18.25	20.25	21.50	5.10
Lead, St. Louis.	5.45	5.50	5.60	3.75
Lead, New York.	5.50	5.55	5.75	3.90
Tin, New York.	36.00	36.62 1/2	40.00	30.87 1/2
Antimony, Asiatic, N. Y.	35.50	35.50	36.25	5.40
Tin plate, 100-lb. box, P'gh.	\$3.10	\$3.10	\$3.10	\$3.25

**oke, Connellsville,**

Per Net Ton at Oven:				
Pumace coke, prompt.	\$1.60	\$1.60	\$1.60	\$1.75
Pumace coke, future.	1.75	1.75	1.75	1.85
Foundry coke, prompt.	2.00	2.00	2.00	2.25
Foundry coke, future.	2.25	2.25	2.25	2.35

**Old Material, Per Gross Ton:**

Iron rails, Chicago.	12.25	12.25	12.25	12.00
Iron rails, Philadelphia.	15.50	15.50	15.00	14.00
Car wheels, Chicago.	11.50	11.25	10.75	11.25
Car wheels, Philadelphia.	12.50	12.50	11.50	11.00
Heavy steel scrap, P'gh.	13.00	12.75	11.75	11.50
Heavy steel scrap, Phila.	12.50	12.25	11.25	10.00
Heavy steel scrap, Ch'go	11.25	10.50	9.75	9.75
No. 1 cast, Pittsburgh.	12.25	12.25	12.25	11.50
No. 1 cast, Philadelphia.	12.50	12.50	12.25	12.00
No. 1 cast, Ch'go (net ton)	9.50	9.25	9.00	9.50

**Finished Iron and Steel f. o. b. Pittsburgh**

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 22.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

**Plates.**—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.25c. base net cash, 30 days. Following are stipulation prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated Feb. 8, 1903, or equivalent, 1/4 in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft. are considered 1/4-in. plates. Plates over 72 in. wide must be ordered 1/4 in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

**Wire Products.**—Prices to jobbers. Fence wire, Nos. 9 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, \$1.40; galvanized, \$2.20. Galvanized barb wire and staples, \$2.50; painted, \$1.70. Wire nails, \$1.60. Galvanized nails, 1 in. and longer, \$1.75 advance over base price; shorter than 1 in., \$2.25 advance over base price. Woven wire fencing, 68 per cent off list for carloads; 68 off for 1000-rod lots; 67 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.									
Nos.	9 to 9	10	11	12	12 1/2	13	14	15	16
Annealed	\$1.55	\$1.60	\$1.65	\$1.70	\$1.80	\$1.90	\$2.00	\$2.10	
Galvanized	2.45	2.50	2.55	2.60	2.70	2.80	3.10	3.20	

**Wire Rods.**—Bessemer, open-hearth and chain rods, \$26.

**Structural Material.**—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zeos, 3 in. and over, 1.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs.	.10
Angles, 3 in. on one or both legs less than 1/4 in. thick, as per steel bar card, Sept. 1, 1909.	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail).	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.	.20 to .80
Deck beams and bulb angles.	.30
Handrail tees.	.75
Cutting to lengths under 3 ft., to 2 ft. inclusive.	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive.	.50
Cutting to lengths, under 1 ft.	1.55
No charge for cutting to lengths 3 ft. and over.	

**Wrought Pipe.**—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from June 17, 1915, all full weight:

Butt Weld			
Inches	Steel	Black	Galv.
1/8, 1/4 and 3/8	72	40 1/2	64
1/2	76	53 1/2	64
3/4 to 3	79	57 1/2	68
			71
Lap Weld			
2	76	54 1/2	55
2 1/2 to 6	78	56 1/2	66
7 to 12	76	54 1/2	67
13 and 14	62 1/2		69
15	60		69
			67
Reamed and Drifted			
1 to 3, butt.	77	55 1/2	69
2, lap	74	52 1/2	69
2 1/2 to 6, lap.	76	54 1/2	69
			64
			65
			67

Butt Weld, extra strong plain ends			
1/8, 1/4 and 3/8	67	43 1/2	61
1/2	72	52 1/2	66
3/4 to 1 1/2	76	56 1/2	70
2 to 3	77	57 1/2	71
Lap Weld, extra strong, plain ends			
2	73	51 1/2	65
2 1/2 to 4	75	53 1/2	67
4 1/2 to 6	74	52 1/2	69
7 to 8	68	46 1/2	68
9 to 12	63	41 1/2	61
			56
Butt Weld, double extra strong, plain ends			
1/2	62	42 1/2	56
3/4 to 1 1/2	65	45 1/2	59
2 to 2 1/2	67	47 1/2	61
Lap Weld, double extra strong, plain ends			
2	63	43 1/2	57
2 1/2 to 4	65	45 1/2	59
4 1/2 to 6	64	44 1/2	58
7 to 8	58	36 1/2	51

1/8, 1/4 and 3/8	67	43 1/2	61	37
1/2	72	52 1/2	66	45
3/4 to 1 1/2	76	56 1/2	70	47
2 to 3	77	57 1/2	71	48

2	73	51 1/2	65	42
2 1/2 to 4	75	53 1/2	67	43
4 1/2 to 6	74	52 1/2	69	46
7 to 8	68	46 1/2	68	45
9 to 12	63	41 1/2	61	40
			56	35

1/2	62	42 1/2	56	34
3/4 to 1 1/2	65	45 1/2	59	37
2 to 2 1/2	67	47 1/2	61	39

2	63	43 1/2	57	34
2 1/2 to 4	65	45 1/2	59	39
4 1/2 to 6	64	44 1/2	58	38
7 to 8	58	36 1/2	51	29

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

**Boiler Tubes.**—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from July 16, 1915.

Lap Welded Steel		Standard Charcoal Iron	
1 1/2 and 2 in.	63	1 1/2 and 2 in.	50
2 1/2 in.	60	2 1/2 in.	47
2 1/2 to 2 3/4 in.	66	2 1/2 and 2 3/4 in.	54
3 and 3 1/4 in.	71	3 and 3 1/4 in.	58
3 1/2 and 4 1/2 in.	72	3 1/2 and 4 1/2 in.	60
5 and 6 in.	65	5 and 6 in.	54
7 to 13 in.	62		

Locomotive and steamship special charcoal grades bring higher prices.

1 1/4 in., over 18 ft., 10 per cent net extra.  
2 in. and larger, over 22 ft., 10 per cent net extra.

**Sheets.**—Makers' prices for mill shipment on sheets of U. S. Standard gage, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount in 10 days from date of invoice.

Blue Annealed Sheets	Cents per lb.
Nos. 3 to 8.	1.30 to 1.35
Nos. 9 to 10.	1.35 to 1.40
Nos. 11 and 12.	1.40 to 1.45
Nos. 13 and 14.	1.50 to 1.55
Nos. 15 and 16.	1.60 to 1.65

*Box Annealed Sheets, Cold Rolled*

	Cents per lb.
Nos. 10 and 11.....	1.40 to 1.45
No. 12.....	1.40 to 1.45
Nos. 13 and 14.....	1.45 to 1.50
Nos. 15 and 16.....	1.50 to 1.55
Nos. 17 to 21.....	1.55 to 1.60
Nos. 22 and 24.....	1.60 to 1.65
Nos. 25 and 26.....	1.65 to 1.70
No. 27.....	1.70 to 1.75
No. 28.....	1.75 to 1.80
No. 29.....	1.80 to 1.85
No. 30.....	1.90 to 1.95

*Galvanized Sheets of Black Sheet Gage*

	Cents per lb.
Nos. 10 and 11.....	3.00 to 3.50
No. 12.....	3.10 to 3.60
Nos. 13 and 14.....	3.10 to 3.60
Nos. 15 and 16.....	3.20 to 3.70
Nos. 17 to 21.....	3.35 to 3.85
Nos. 22 and 24.....	3.55 to 4.05
Nos. 25 and 26.....	3.70 to 4.20
No. 27.....	3.85 to 4.35
No. 28.....	4.00 to 4.50
No. 29.....	4.75
No. 30.....	5.00

**Pittsburgh**

PITTSBURGH, PA., July 27, 1915.

Activity among the steel mills is becoming greater. This week the leading steel companies are operating their mills to practically 100 per cent. The Carnegie Steel Company is understood to be sold up on the different products it makes for three months or more. Consumers who did not have much faith in the improvement in the steel business now find they cannot increase contracts placed some time ago at favorable figures. All the larger mills are quoting 1.30c. on plates, shapes and bars, and one maker states it is not anxious to book more orders even at this price. Several quotations of 1.35c. on shapes and steel bars have been made for last quarter delivery. It is estimated that 20 to 25 per cent of the output of the steel mills is being taken up in war materials for shipment abroad. The shortage in supply of open-hearth steel is largely attributed to so much of this material going into rounds for shrapnel purposes. There is some betterment in the pig-iron market, but as yet prices are not much higher. The scrap trade is more active, but coke is quiet. Galvanized sheets are lower. Some galvanizing concerns have stocks of spelter on hand which they bought at fairly favorable prices, and they are now anxious to realize on galvanized products at present high prices.

**Pig Iron.**—New inquiry has not been quite so active, but prices are firm. Sellers are now quoting \$14.25, Valley furnace, for standard Bessemer, one interest reporting a sale on that basis of 1500 tons for delivery over the remainder of the year, and there have been several small sales of 100 and 200 ton lots at the same price. The Colonial Steel Company, which was inquiring for 10,000 tons of basic iron for delivery over ten months, has bought from a local interest 2500 tons for shipment over the remainder of the year at \$13, Struthers furnace, from which point the iron will be shipped. As yet nothing has been done on the inquiry of the Westinghouse Electric & Mfg. Company for 10,000 tons of foundry iron for delivery over last quarter of this year and first quarter of 1916. Some furnaces decline to quote so far ahead. We also note a sale of 600 tons of malleable Bessemer iron at \$13, Valley furnace. We quote: Standard Bessemer iron, \$14.25; basic, \$13; No. 2 foundry, \$12.75 to \$13, the lower price for prompt shipment; gray forge, \$12.50 to \$12.75, and malleable Bessemer, \$13, all at Valley furnace, the freight rate for delivery in the Pittsburgh and Cleveland districts being 95c. a ton.

**Billets and Sheet Bars.**—Nearly all consumers are covered and are specifying freely against their contracts. New inquiry is light. Up to Saturday, July 24, the billet and rail sales bureau of the Carnegie Steel Company had sent orders to the mills for rolling as much tonnage as it booked in the entire month of June, which was a record month for more than two years. Billets and sheet bars have sold for prompt shipment as high as \$23, Youngstown. A small sale of forging billets was made at \$29, Pittsburgh, but this is slightly above the market. We quote: Bessemer and open-hearth billets, \$21.50 to \$22, and Bessemer and open-hearth

sheet bars, \$22.50 to \$23, Youngstown mills; Bessemer and open-hearth billets, \$22 to \$22.50, and Bessemer and open-hearth sheet bars, \$23 to \$23.50, f.o.b. Pittsburgh. Forging billets are \$28 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take \$1 per ton extra. Axle billets are held at \$24.

**Ferroalloys.**—It is said English producers are willing to make contracts for 80 per cent ferromanganese at \$88, seaboard, but will give no guarantee as to deliveries. In preference to buying in this uncertain way consumers who need ferromanganese are buying in small lots at about \$100, seaboard, and several carloads have been sold at this price recently. Effective Aug. 1 the freight rate on ferromanganese from Baltimore to Pittsburgh will be \$2.46; from Philadelphia, \$2.56, and from New York City, \$2.76, each of these new rates showing an advance of 16c. per ton. We quote 50 per cent ferrosilicon in lots up to 100 tons, at \$73; over 100 tons to 600 tons, \$72, and over 600 tons, \$71, delivered in the Pittsburgh district. We quote 10 per cent ferrosilicon at \$17; 11 per cent, \$18; 12 per cent, \$19, all f.o.b. cars at furnace, Ashland, Ky., Jackson or New Straitsville, Ohio, each of these points having a rate to Pittsburgh of \$2 per gross ton. We quote 20 per cent spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in smaller lots.

**Structural Material.**—New inquiry is active and some fairly large lots have been placed. The Jones & Laughlin Steel Company has taken 5600 tons for city and county buildings to be erected in this city, and 1000 tons for an addition to the Bulletin Building in Philadelphia. The American Bridge Company has taken 2500 tons for a new steel building for the Shelby Steel Tube Company at Ellwood City, Pa., and 400 tons for a new steel building for the Willys-Overland Company at Toledo, Ohio. The McClintic-Marshall Company has taken 2000 tons for an extension to the present open-hearth building of the Republic Iron & Steel Company at Youngstown, Ohio, and has also taken several other large contracts, details of which are not ready to be given out. The Fort Pitt Bridge Works has taken 1700 tons of bridge work for the Pennsylvania Railroad and 330 tons for the Baltimore & Ohio. The Riter-Conley Mfg. Company has taken 1100 tons for a municipal building at Detroit, Mich., and 150 tons for a crane runway for the General Electric Company at Erie, Pa. Bids have gone in on a pier shed at the Panama Canal, 2000 tons. The structural mills are pretty well filled up on shapes and other products and the market is very firm. We quote beams and channels up to 15 in. at 1.25c. to 1.30c., f.o.b. Pittsburgh, the two local mills quoting the higher price in nearly all cases.

**Plates.**—Active inquiries out for cars include 1000 steel gondolas for the Lake Shore, 1500 automobile cars for the New York Central, 400 mine cars for the H. C. Frick Coke Company and 50 for the Virginia Iron, Coal & Coke Company. The Carnegie Steel Company is understood to be sold up on plates for the next three months or longer, and the larger plate mills are quoting 1.30c. in nearly all cases. The small plate mills are also well filled and prices are firm. We quote ¼-in. and heavier plates at 1.25c. to 1.30c., for delivery over remainder of the year.

**Steel Rails.**—Small domestic orders for 500 and 1000 ton lots of steel rails are being placed, but there is no large buying. The rail mills at the Edgar Thomson works are running full, making standard section rails, light rails, sheet bars and shrapnel rounds. The new demand for light rails is fairly active from the lumber interests, but from the coal mining concerns is quiet. Prices are reported firm. We quote standard section rails of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10-lb. sections, 1.275c.; 12 and 14-lb., 1.225c.; 16 and 20-lb., 1.175c.; 25, 30, 35, 40 and 45-lb. sections, 1.125c. The prices of light rails are materially shaded on large lots.

**Tin Plate.**—As usual at this season, specifications

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against contracts for tin plate are slowing down, and unless there is improvement in the near future, operations among some of the mills will be at a reduced gait. The unusually cold and wet weather which prevailed during May and June has probably had its influence on the tin-plate market, and large consumers are not specifying as freely as probably otherwise would have been the case. There is some foreign inquiry, but no large orders have recently been closed. On the few domestic orders being placed, we quote 14 x 20 coke plates at \$1.10 to \$3.20 per base box. On a desirable specification the lower price would be shaded.

**Sheets.**—The new demand for blue annealed sheets is heavier than for some time, and several mills have advanced prices \$1 per ton, now quoting 1.35c. minimum. There is little demand for galvanized sheets, but prices are lower, some mills that have spelter in stock, bought at fairly low prices, desiring to realize the good profits that present prices of galvanized sheets afford. The general range on galvanized sheets for No. 28 gage is from 4c. to 4.50c., depending on the quantity wanted and the customer. Prices on Bessemer black sheets are firmer, but have not responded to the higher prices and scarcity of sheet bars. We quote No. 28 Bessemer black sheets at 1.75c. to 1.80c.; No. 28 galvanized, 4c. to 4.50c.; Nos. 9 and 10 blue annealed sheets, 1.35c. to 1.40c.; No. 30 black plate, tin-mill sheets, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

**Wire Rods.**—There is still some foreign inquiry, and domestic consumption is very heavy. Mills are filled for some months and have few rods to spare for the open market. One local mill that is a large producer of rods has not sold any in the open market for several months. Prices are firm, and we quote Bessemer, open-hearth and chain rods at \$26 to \$27, f.o.b. Pittsburgh.

**Wire Products.**—This trade is very active, and local mills are pretty well filled for the remainder of the year. There is a heavy foreign demand for barb wire and other wire products, and several makers are so well booked they are not bidding on this business. There are still some contracts for wire nails at the \$1.55 basis and plain wire at \$1.35, on which deliveries are being made, but on all new orders the market is firm and the mills are quoting full prices. In carloads and larger lots wire nails are selling at \$1.60, galvanized nails 1-in. and longer taking an advance over this price of 1.75, and shorter than 1-in., \$2.25. Some mills are asking higher prices on galvanized nails. Plain annealed wire is \$1.40; galvanized barb wire and fence staples, \$2.50; painted barb wire, \$1.70; polished fence staples, \$1.70, all f.o.b. Pittsburgh, with freight added to point of delivery, terms 60 days net, less 2 per cent for cash in 10 days. Prices on woven wire fencing are 69 per cent off in carload lots, 68 per cent on 1000-lb. lots, and 67 per cent on small lots, f.o.b. Pittsburgh.

**Skelp.**—The new demand is heavier than for some time, and the mills are pretty well filled for the next two or three months. Prices are firm and at least \$1 per ton higher. There is some foreign inquiry for skelp, but local mills are filled on domestic orders, and as a rule are not quoting. We quote grooved steel skelp at 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp, 1.75c. to 1.80c., delivered to consumers' mills in the Pittsburgh district.

**Iron and Steel Bars.**—The steel-bar market continues active. An inquiry recently came in this market from Cleveland for 100,000 tons of rounds, on which at least one local mill refused to quote, being unable to make deliveries. On the smaller sizes of rounds and flats, the steel-bar mills are getting behind, one mill not promising deliveries on certain sizes before November. All the steel-bar capacity in the Pittsburgh district is operating to 100 per cent, and is engaged from three to four months ahead. Some consumers who did not have faith in the improvement in the steel market

are now coming back to the mills and stating that they underestimated their needs and are trying to cover for more bars at prices \$1 to \$2 a ton lower than the mills are now quoting. In these cases the mills simply say they are sold up and do not care to book more business at less than the regular 1.30c. price for delivery ahead. One local mill has quoted 1.35c. on steel bars for last quarter. The new demand for reinforcing bars is heavier and prices are stronger. The new demand for iron bars is heavier, and the mills have more orders on their books than at any time in more than a year. We quote steel bars at 1.25c. to 1.30c. for third quarter, one or two mills refusing to sell at less than 1.30c.; common iron bars, 1.25c. to 1.30c., and test iron bars, 1.35c. to 1.40c., all f.o.b. Pittsburgh.

**Railroad Spikes.**—Nearly all the railroads have covered on their needs of spikes for this year and the new demand is quiet, but makers of spikes state they are filled for the next two or three months and that specifications are coming in quite freely. Prices on spikes have not yet shown the advance warranted by the higher market on steel. We quote standard sizes of railroad spikes at \$1.40, and small railroad and boat spikes at \$1.50 per 100 lb., f.o.b. Pittsburgh.

**Cold-Rolled Strip Steel.**—Prices are firm and the demand is heavy. There is still a good deal of foreign inquiry, mostly from England and France, for cold-rolled strip steel, and one local mill has made recently several fairly large shipments to the latter country. As a rule, however, foreign business in this material has not been entirely satisfactory to the makers, owing to the difficulty in finding out just what foreign consumers want in these products. The mills have a large amount of orders on their books and in some cases \$2.95 base is being quoted on small lots. We quote hard-rolled steel, 1½-in. and wider, under 0.20 carbon, sheared or natural mill edge, per 100 lb., \$2.85, delivered. Extras, which are standard among all mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier.....	Base	\$0.25	\$0.10
0.099 to 0.050.....	\$0.05	0.25	0.15
0.049 to 0.035.....	0.20	0.25	0.15
0.034 to 0.031.....	0.35	0.40	0.25
0.030 to 0.025.....	0.45	0.40	0.40
0.024 to 0.020.....	0.55	0.40	0.50
0.019 to 0.017.....	0.85	0.50	1.10
0.016 to 0.015.....	1.25	0.50	1.10
0.014 to 0.013.....	1.95	0.50	1.25
0.012.....	2.30	0.50	coils only
0.011.....	2.65	0.50	coils only
0.010.....	3.00	0.50	coils only

**Rivets.**—Domestic demand is heavier than for a long time, and foreign inquiry is also very active. Quite large shipments abroad are being made regularly by local makers, mostly to China, India, and Africa. Makers state that the foreign business is very satisfactory, payments being prompt, but rivets for foreign shipment have to be put up in different style packages than for domestic trade, and in some cases the shapes of the rivets are different. One local maker has shipped two carloads to China recently. We quote buttonhead structural rivets at \$1.50 to \$1.60 and cone-head boiler rivets at \$1.60 to \$1.70 per 100 lb. in carload lots, f.o.b. Pittsburgh, smaller lots bringing from 5c. to 10c. advance.

**Merchant Steel.**—The new demand is active and mills are filled up on orders for several months. Shipments in July were much the heaviest in any one month this year. Prices are firm and higher. For small lots we quote: Iron finished tire ½ x 1½ in. and larger, 1.50c. base; under ½ x 1½ in., 1.65c.; planished tire, 1.70c.; channel tire, ¾ to 1 in., 2c. to 2.10c.; 1½ in. and larger, 2.10c.; toe calk, 2.10c. to 2.20c. base; flat sleigh shoe, 1.85c.; concave and convex, 1.90c.; cutter shoe, tapered or bent, 2.40c. to 2.50c.; spring steel, 2.10c. to 2.20c.; machinery steel, smooth finish, 1.90c.

**Steel Carwheels.**—The two local makers report they are filled up on orders for several months ahead. We quote standard 33-in. freight carwheels, 6¼-in. rough bore, at \$16, and standard 36-in. passenger, the same bore, at \$22.50 per wheel, f.o.b., Pittsburgh.



**Nuts and Bolts.**—Makers report the new demand active, but most consumers covered their needs some time ago, or before the recent advance in prices, and are specifying very freely against contracts. It is said discounts are being firmly held and to the large trade are as follows:

*U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed*

$\frac{1}{2}$  in. and smaller, hex. .... 7.8c. per lb. off  
 $\frac{3}{4}$  in. and larger, hex. .... 7.1c. per lb. off  
 Square, all sizes .... 5.6c. per lb. off

*Semi-Finished Tapped*

$\frac{1}{2}$  in. and smaller hex. .... 85-10-10-5 off  
 $\frac{3}{4}$  in. and larger hex. .... 85-10-5 off

*Black Bulk Rivets*

7/16 x  $6\frac{1}{2}$ , smaller and shorter. .... 80-10-5 off

*Package Rivets 1000 Pcs.*

Black, metallic tinned and tin plated. .... 75-10-10 off

Discounts on bolts as recently adopted are as follows:

Common carriage bolts,  $\frac{3}{4}$  x 6, S. & S. rolled, 75-10-10; cut, 75-10-5; larger or longer, 75-5. Machine bolts, h. p. nuts,  $\frac{3}{4}$  x 4, S. & S. rolled, 75-2/10-5; cut, 75-2/10; larger or longer, 75-5. Machine bolts with C. P. & C. & T. nuts,  $\frac{3}{4}$  x 4, S. & S., 75-10; larger or longer, 75. Bolts without nuts, 6 in. and shorter, extra 10 per cent; longer lengths, extra 5 per cent. G. P. coach screws, 75-2/10-5. Nuts, blank or tapped, h. p. square, 6.20; hexagon, 7.00.

**Shafting.**—The new demand is heavy. Specifications from automobile builders and implement makers are coming in freely. Several makers of shafting state they are back in deliveries from three to four weeks. The Columbia Steel & Shafting Company, Pittsburgh, one of the largest makers, is quoting 65 per cent off in carloads and larger lots, and 60 per cent on smaller lots, f.o.b., Pittsburgh. Another maker will make the same advance within the next few days. We quote cold-rolled shafting at 65 per cent to 66 per cent off in carloads and larger lots, and 60 to 61 per cent off in small lots, f.o.b., Pittsburgh.

**Hoops, Bands, and Cotton Ties.**—Nearly all large consumers of cotton ties have covered for their season's requirements. The new demand for hoops and bands is active, and bands are now quoted by several leading makers at 1.30c., while hoops are unchanged. In exceptional cases, steel bands are still being quoted at 1.25c. for third quarter shipment. We quote cotton ties at 85c. per bundle for July, with  $\frac{1}{2}$ c. advance for each succeeding month. We quote steel bands at 1.25c. to 1.30c., extras as per the steel bar card, and steel hoops at 1.30c. to 1.35c., f.o.b., Pittsburgh.

**Wrought Pipe.**—New orders entered by the mills in July were not as heavy as in June, owing to the advances in prices on June 2 and 17, and also to the very light demand for oil country goods. The mills are pretty well filled up with orders placed some time ago and are running from 75 to 85 per cent of capacity. Discounts on iron and steel pipe are firmly held.

**Boiler Tubes.**—The new demand is more active than for some time and it is stated that discounts, effective from July 16, on both iron and steel boiler tubes are being firmly held.

**Coke.**—Reports of an inquiry in the market for 10,000 tons of blast furnace coke per month over the remainder of this year are not confirmed. Several merchant blast furnaces that are now idle are talking of starting up if prices of pig iron advance a little more, and have some feelers out for coke, but these have not as yet assumed the form of definite inquiries. New inquiry for foundry coke is quite active, and a number of contracts have recently been closed for delivery over the remainder of the year. Prompt furnace coke is quiet and prices are only fairly strong. We quote standard makes of prompt furnace coke at \$1.60 to \$1.65, with sales reported as high as \$1.70; for delivery over the remainder of this year some producers are quoting as high as \$1.85 for standard blast furnace coke, but we are not advised of any sales at this figure. We quote standard 72-hr. foundry coke at \$2 to \$2.25 for prompt delivery, and from \$2.25 to \$2.50 on contracts for remainder of the year, per net ton at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ended July 17, as 371,144 net tons, an increase over the

previous week of 30,402 tons, and the heaviest output in any one week for more than a year.

**Old Material.**—Prices on nearly all grades of scrap for steel making purposes are higher. Dealers who have sold heavy steel melting scrap short are now offering as high as \$13 to cover. The embargo on scrap destined for the Pittsburgh Steel Company, Monessen, Pa., has been lifted and shipments are now going forward. Dealers state that they cannot buy heavy steel scrap from each other at less than \$13 to \$13.25, but when they name these prices to consumers they are turned down. The market on heavy steel scrap is all of \$12.75 to \$13, and several sales are reported at the higher price. Borings are also very firm and we note a sale of 1000 tons at about \$9.10, delivered in the Pittsburgh district, and also a sale of about 500 tons at \$9, delivered in the Youngstown district. Dealers are now quoting as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	\$12.75 to \$13.00
Compressed side and end sheet scrap	11.50 to 11.75
No. 1 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.50 to 11.75
No. 1 railroad malleable stock	11.00 to 11.25
Railroad grate bars	8.00 to 8.25
Low phosphorus melting stock	15.75 to 16.00
Iron car axles	18.75 to 19.25
Steel car axles	13.75 to 14.00
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	10.25 to 10.50
No. 2 busheling scrap	7.75 to 8.00
Machine shop turnings	7.50 to 7.75
Old carwheels	11.75 to 12.00
Cast-iron borings	9.00 to 9.25
*Sheet bar crop ends	12.00 to 12.25
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	11.50 to 11.75
Heavy steel axle turnings	9.00 to 9.25
Heavy breakable cast scrap	11.00 to 11.25

\*Shipping point.

## Chicago

CHICAGO, ILL., July 28, 1915.—(By Wire.)

The rapidly changing aspects of the iron and steel market manifest the unusual influences at work. For some products there is a demand in excess of producing capacity, while other forms of steel are neglected. The range of prices presents many incongruities, such products as black sheets, railroad track fastenings and other lines for which there is only a domestic demand commanding prices far below the basis which would be normally suggested by the semi-finished material situation. The westward moving flood of inquiries for billets and steel bars of easily recognized specifications is now centering here. Forging billets have advanced from \$23 to \$26, and on steel bar and shell forging inquiries, if deliveries are quoted at all, six weeks to two months is the limit. Aside from the steel-bar situation, the congestion of which, due to export business, is augmented by the liberal specifications from implement manufacturers, the mills are rapidly filling up on structural orders, and delivery conditions closely approach those applicable to bars. The West is still being called upon for large shipments of billets to the Pittsburgh district, and is booking orders for export billets and sheet bars at the rate of about 1000 tons a day. For some of the mills a comfortable tonnage of plates is now in hand, but sales on as low a basis as 1.15c. Pittsburgh, were made as late as last week. The rapidity with which the demand for steel has increased has temporarily outrun steel making iron production, an evidence of which is the heavy purchases of steel scrap in this market by the leading interest. This buying of steel scrap has resulted in an unusual advance in all old material prices and abnormal premiums for some grades. The railroads are not buying new rails, and the heavy demand for spikes, bolts and tie plates suggests the relaying of rails now in service. Tie-plate prices have advanced \$2 per ton within a month, but are still relatively low. This condition also applies to a number of the more highly finished articles. An advance of \$1 per ton has been made on black sheets and blue annealed, while galvanized sheets, both from mill and out of stock, are being quoted at lower prices. Pig-iron inquiry involves no tonnages of unusual im-

portance, but the market is very firm, an advance to the basis of \$10.50, Birmingham, being effective, with some of the Southern furnaces. Ohio silvery iron has been advanced also.

**Pig Iron.**—Furnaces in the South which were active on the basis of \$9.75 and \$10, Birmingham, have booked orders to so large a proportion of their capacity that they are now disinclined to push sales, and are holding out for \$10.50 at the furnace. The general market has not advanced to this figure, however, and \$10 iron can still be bought. Inquiry is limited and includes several lots of 500 to 1000 tons, together with some inquiry for less amounts of charcoal iron. The foundry melt is heavier, and the competition for casting business is less keen, indicating a greater volume of work. Lake furnaces have assumed a very positive attitude with regard to prices, \$13 for No. 2 being a clearly defined minimum. Recent purchases of 10 per cent silvery iron brought out a price of \$17 at Chicago furnace, which compares with the advance of Ohio silvery iron to the basis of \$15.50 at the furnace for 10 per cent, or \$18.04, delivered Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 to 5.....	\$15.75
Lake Superior charcoal, No. 1.....	16.25
Lake Superior charcoal, No. 6 and Scotch.....	16.75
Northern coke foundry, No. 1.....	\$13.50 to 13.75
Northern coke foundry, No. 2.....	13.00 to 13.50
Northern coke foundry, No. 3.....	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft.....	14.25 to 14.50
Southern coke, No. 2 f'dry and 2 soft.....	13.75 to 14.00
Malleable Bessemer.....	13.00 to 13.25
Standard Bessemer.....	16.50
Basic.....	12.50 to 13.00
Low phosphorus.....	20.00 to 20.50

(By Mail)

**Rails and Track Supplies.**—The sustained and, in contrast with rail business, unusually heavy buying of track supplies is an interesting feature. But one conclusion can be drawn with respect to road-bed repairs, namely, that the railroads are making the old rails serve. Specifications from the New York Central Lines for several thousand kegs of spikes have just been placed in Chicago, and the Great Northern has bought a total of 2700 kegs of spikes and bolts. Other orders and specifications of similar proportions are reported. The railroads are steadily increasing their use of tie plates, the Illinois Central releasing specifications for about 2000 tons, while one of the trunk lines of the Northwest placed its order for 1000 tons and has taken prices on an additional 1000 tons. Although still singularly low as compared with quotations for other steel products, tie-plate prices are showing a pronounced upward tendency. Whereas quotations of \$23, f.o.b. mill, were made in June and \$24 about two weeks ago, \$25 a ton was asked last week for a similar tonnage. Demand for rails is still light and the mills are becoming reconciled to a lean year. The report of the purchase of 6000 tons of rails by the Monon cannot be substantiated but probably arises from the contract for 3000 tons placed by that road a few weeks ago. The Chesapeake & Ohio of Indiana has placed a small order, and the Burlington has bought a few hundred tons of frogs and switches. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts with square nuts, 1.90c. to 2c., base, all in carload lots, Chicago; tie plates, \$25 to \$26, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base, open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

**Structural Material.**—Specifications from the car builders for structural steel are coming in steadily and in such volume as to form the larger part of current orders, although the amount of steel being taken by fabricators is rapidly increasing. It is estimated that car shops in this district now have about three months' work ahead of them. The Omaha has placed an order for 300 freight cars with the American Car & Foundry Company, the New York Central Lines are asking prices on 1500 automobile cars, and the Norfolk & Western is

in the market for 900 coal cars. In addition, there is miscellaneous inquiry for small lots of cars of various types. Fabricated steel contracts placed last week include 2950 tons for the Overland warehouse at St. Paul, awarded to the Minneapolis Steel & Machinery Company; 3125 tons for the Y. M. C. A. Hotel building, Chicago, placed with the American Bridge Company; about 800 tons for a Colorado River bridge, formally placed with the Kansas City Structural Steel Company this week; 526 tons for the Palace Hippodrome at Milwaukee, awarded to the Milwaukee Bridge Company and about 700 tons in three smaller jobs. The prices of fabricated steel, which have been exceptionally low, show some slight improvement. The firmness of the market cannot be questioned although the quotation of 1.30c., Pittsburgh, is not as yet the price at which much of the current business is going. We quote for Chicago delivery of plain material from mill 1.489c.

With mill deliveries quoted from six weeks to two months the warehouses are rapidly approaching a demand for the exercise of their normal function of quick deliveries. That they anticipate a substantial increase in orders out of store is indicated by negotiations under way for the replenishing of their stocks. We quote for Chicago delivery of structural shapes out of stock 1.75c.

**Plates.**—While the mills at Chicago are now in a fairly comfortable situation as regards plates, and 1.25c., Pittsburgh, is the minimum open quotation, business is being solicited in this market at lower prices. One Ohio mill is understood to be offering a limited tonnage, within the range of sizes it can roll, as low as 1.15c., Pittsburgh, and there is little doubt that 1.20c. can be done. We quote for Chicago delivery of plates from mill 1.389c. to 1.439c.

We quote for Chicago delivery of plates out of store 1.75c.

**Sheets.**—One of the important sheet makers has advanced its quotation for black sheets to a minimum of 1.80c., Pittsburgh, for No. 28 gage, although the market cannot be said to be uniformly at this level. This advance does not signify the use of black sheets as a substitute for galvanized to any great extent, for the trade has been slow to accommodate itself to this suggestion, but an adjustment of the sheet price to that of semi-finished steel. With the lowering in the price of spelter, quotations on galvanized sheets are easier, though still too high to effect any change in the general situation. For such business as is being placed, 4.50c., Pittsburgh, is the ruling price on No. 28. We quote for Chicago delivery from mill, No. 10 blue annealed, 1.539c.; No. 28 black, 1.989c.; No. 28 galvanized, 4.689c. to 4.789c.

The price of galvanized sheets out of store has been reduced from the basis of 4.85c., for No. 28, to 4.70c. for No. 22 and lighter, and 4.50c. for No. 20 and heavier. We have revised our prices and quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 22 galvanized, 4.70c.

**Bars.**—The rapid overflow of war business into this territory is now being felt with emphasis in the flood of inquiry for bars of shrapnel specifications which are being received from forge shops on every hand. An inquiry for prices on 1000 tons of bars per month from a Moline, Ill., manufacturer of power press and shearing machinery, a similar inquiry covering 300 tons a month from a Cleveland, Ohio, manufacturer of heavy machinery and an inquiry for 3000 tons from a local manufacturer of railroad equipment are typical instances. Quotations are being secured from the mills on this material with considerable difficulty, and the extent to which the demand can be met is already problematical. Better delivery than two months is the exception for bars. Forging billets have advanced \$3 a ton, to \$26. The strong influence of the mild-steel bar situation is shown in an advance of \$1 a ton in the price of rail-carbon bars, but a typical anomaly of the situation is the low price still prevailing for twisted and deformed bars for reinforcing purposes. Inquiry for reinforcing steel is not particularly plentiful. Among recent orders was one for bars for the Pettibone-Mulliken addition, which were rolled from billets by a bar-iron mill, steel mills being unable to make a delivery in less than six weeks. In the Methodist Book



Concern's building at Chicago reinforced concrete construction was substituted for structural steel. Bar-iron tonnage shows no improvement in volume, but the price continues firm. We quote for mill shipment as follows: Bar iron, 1.20c.; soft steel bars, 1.489c.; hard steel bars, 1.25c.; shafting, in carloads, 65 per cent off; less than carloads, 58 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes  $\frac{1}{2}$  in. and over and usual card extras for smaller sizes; shafting 58 per cent off.

**Rivets and Bolts.**—Screw and bolt manufacturers are now finding their plants comfortably fixed as to business, specifications against recent contracts coming in rapidly. With this improvement a corresponding moderation in price competition is noted. A fair demand for rivets is reported. Quotations are as follows: Carriage bolts up to  $\frac{3}{8}$  x 6 in., rolled thread, 80-10; cut thread, 80-5; larger sizes, 75-15; machine bolts up to  $\frac{3}{8}$  x 4 in., rolled thread, with hot pressed square nuts, 80-15; cut thread, 80-10; larger sizes, 80; gimlet point coach screws, 85; hot pressed nuts, square, \$6.40 off per cwt.; hexagon, \$7.30 off per cwt. Structural rivets,  $\frac{3}{4}$  to 1 $\frac{1}{4}$  in., 1.65c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 1.95c.; boiler rivets, 2.05c.; machine bolts up to  $\frac{3}{8}$  x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to  $\frac{3}{8}$  x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square, \$6, and hexagon, \$6.70 off per cwt.

**Old Material.**—This market has seldom presented more interesting or unusual conditions. The dominating influence has been the exceptional demand for steel scrap, the chief feature of which has been buying by the Illinois Steel Company. It is estimated that an aggregate of 20,000 tons was taken by this interest at a price around \$11 per gross ton, and additional material is being taken in at prices at least as high as \$11.50. This is only the second time since the establishment of the Gary works that the Illinois Steel Company has been a buyer of scrap in this market in any considerable quantity. Its present activity can be traced to the disparity between blast-furnace and open-hearth capacity at Gary, a situation which will be relieved somewhat within the next week, by the blowing in of additional furnaces at South works. The extraordinary demand for steel scrap has set up some unusual relationships among the other grades of material, affecting No. 2 wrought scrap in particular, which, by reason of its use as shoveling steel, is being quoted on a parity and even higher than No. 1 wrought. Many interesting trades and transactions are reported in the general eagerness to secure steel. Rolling-mill grades are not much in demand, but the general advance of the market has carried all material to a higher level. Among the railroads, the Rock Island has some scrap to sell and the Burlington has a list of 2300 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

#### Per Gross Ton

Old iron rails	\$12.25 to \$12.50
Old steel rails, rerolling	10.50 to 11.00
Old steel rails, less than 3 ft.	11.25 to 11.75
Relaying rails	19.50 to 20.50
Old carwheels	11.50 to 11.75
Heavy melting steel scrap	11.25 to 11.50
Frogs, switches and guards, cut apart	11.25 to 11.50
Shoveling steel	11.00 to 11.25
Steel axle turnings	7.75 to 8.00

#### Per Net Ton

Iron angles and splice bars	\$12.50 to \$13.00
Iron arch bars and transoms	12.75 to 13.25
Steel angle bars	10.00 to 10.25
Iron car axles	14.00 to 14.25
Steel car axles	10.50 to 11.00
No. 1 railroad wrought	9.50 to 9.75
No. 2 railroad wrought	9.75 to 10.00
Cut forge	9.75 to 10.00
Steel knuckles and couplers	10.25 to 10.50
Steel springs	10.25 to 10.50
Locomotive tires, smooth	9.50 to 9.75
Machine shop turnings	5.25 to 5.75
Cast borings	5.25 to 5.75
No. 1 busheling	7.50 to 8.00
No. 2 busheling	6.50 to 7.00
No. 1 boilers, cut to sheets and rings	7.00 to 7.50
Boiler punchings	9.00 to 9.50
No. 1 cast scrap	9.50 to 10.00
Stove plate and light cast scrap	8.25 to 8.50
Grate bars	8.00 to 8.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.75 to 9.00
Pipes and flues	7.00 to 7.25

**Wire Products.**—The domestic market in wire products is being maintained with evidences of a latent strength borrowed largely from heavy exports. The movement of wire displays some of the irregularities which are a reflection of the uncertainty of harvesting operations imposed upon the farming districts by abnormal weather conditions. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.589; wire nails, \$1.739 to \$1.789; painted barb wire, \$1.889; galvanized barb wire, \$2.689; polished staples, \$1.889; galvanized staples, \$2.689; all Chicago.

**Cast-Iron Pipe.**—At Cincinnati, Ohio, 400 tons of high-pressure pipe has been awarded to the United States Cast Iron Pipe & Foundry Company, and at Joliet, Ill., quotations are being received on 600 tons of small pipe. The aggregate of small orders taken last week shows an increase in business of this kind. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$26; 6 to 12 in., \$24; 16 in. and up, \$23.50, with \$1 extra for Class A water pipe and gas pipe.

## Philadelphia

PHILADELPHIA, PA., July 20, 1915.

There has been little diminution in the demand for steel products and where buying is less it is largely because makers have assumed a firmer attitude, due to well filled order books and the disposition not to contract for heavy tonnages, unless at higher prices. The 1.30c. Pittsburgh base, for finished rolled products is being more generally adhered to in this district and the market is gradually coming under the domination of sellers, rather than being a buyers' market. Deliveries are strong factors in current business, but few mills being able to make even reasonably prompt shipments. While considerable foreign business is under negotiation and new inquiries continue to come out, the higher prices asked have checked buying to some extent. In instances better figures are to be obtained from domestic consumers than foreign purchasers are willing to pay. Eastern makers of steel billets have been almost swamped with orders and now find themselves in the position of not being able to quote on tonnage business for this year's delivery. Current prices for basic open-hearth steel billets have advanced \$6 to \$8 a ton. Inquiry for billets for export has been passed up without quotations by some of the Eastern mills. Pig iron is quieter in the foundry grades but prices are definitely stronger. Steel making irons are active and prices are higher. A sale of 10,000 tons of basic at close to \$14, delivered, is noted. Round lot sales of low phosphorus pig continue to be made, and prices are hardening. The old material market is stronger, particularly heavy melting steel and rolling-mill scrap, for which prices are advancing.

**Iron Ore.**—While no important transactions are reported, deliveries on foreign ore have come in more freely. Importations during the week ended July 24, include 7600 tons from Chile, 14,348 tons from Sweden and 4750 tons from Cuba.

**Pig Iron.**—While the market is strong sentimentally and prices are gradually moving toward a higher level, the actual volume of business, particularly in the foundry grades, has been relatively small. Statistically the position of the furnaces, both as to condition of order books and tonnage of iron on furnace yards, is good, but the market lacks the stimulus of regular and consistent buying. Foundrymen have experienced but meager orders for their products and are inclined to await developments. In the majority of cases requirements, under the restricted basis of operations, such as have been in effect for some time, have been fully covered and sellers do not encourage further extended purchases at current prices. A number of moderate lot sales, upward of a few hundred tons, for varying delivery over the remainder of the year, have been reported, in a large majority of cases at prices above the recently quoted minimum. Sales of standard brands of eastern Pennsylvania No. 2 X foundry have been freely made at prices ranging from \$14.49 to \$14.75, delivered in this district. Some furnaces hold at \$14.75, delivered here, as a minimum, and make sales to regular



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customers at that price. Apparently the \$14.25 delivered minimum for standard 2 X foundry has disappeared. Little new tonnage inquiry has come out, although a stove foundry is reported to have closed for forward of 1500 tons for delivery over the remainder of the year. Virginia foundry iron has been selling in moderate lots at varied prices. No. 2 X Virginia foundry ranges from \$12.50 to \$12.75 at furnace, dependent on delivery. Sales have also been made at higher figures, and one transaction of a special analysis iron was at \$13.70 at furnace. Cast-iron pipe makers are selling around for low grade iron, but are not anxious to pay current prices. Southern foundry iron is being sold at \$10, Birmingham basis, for No. 2, delivery over the remainder of the year. In steel making irons the principal sale was a block of practically 10,000 tons of basic iron, for early delivery, shipments beginning at once, taken by an Eastern mill at close to \$14, delivered. This figure now represents the minimum, and some makers are holding at \$14.25. In low phosphorus iron buying continues active. One sale of Lebanon Valley low phosphorus, some 10,000 tons for delivery over the remainder of the year, is announced, a customer duplicating a former order. Negotiations for a block of 3000 tons are still pending. Standard analysis low phosphorus is very firm, a sale of 500 tons at better than \$22, delivered, being reported. Lebanon Valley low phosphorus is now held at \$17 at furnace as a minimum. Quotations for standard brands, delivered in buyers' yards, in this district, shipment over the remainder of the year, range about as follows:

Eastern Penna. No. 2 X, foundry....	\$14.50 to \$14.75
Eastern Penna. No. 2 plain.....	14.25 to 14.50
Virginia, No. 2 X, foundry.....	15.25 to 15.75
Virginia, No. 2 plain.....	15.00 to 15.25
Gray, forge.....	13.25 to 13.50
Basic.....	14.00 to 14.25
Standard low phosphorus.....	21.50 to 22.00

**Ferroalloys.**—Inquiries for moderate tonnages of ferromanganese continue to come out, but selling agents have not been licensed as yet to make sales of foreign or forward delivery, even for August shipment. Sales are confined to lots afloat and it is believed that a considerable tonnage is on the way over. Arrivals at this port last week comprised 1670 tons, from England, of which it is stated 300 tons was for consumers in this district. Foreign 80 per cent ferromanganese is held at \$100 per ton, seaboard. Domestic makers, who are now pretty well booked up, are holding at \$105 at furnace for the same grade. Small sales of both foreign and domestic have been made at the prices named. Fifty per cent ferrosilicon is quoted at \$71 to \$73, Pittsburgh, dependent on quantity.

**Bars.**—New business in steel bars has been comparatively light. Most of the large domestic buyers have contracted and specifications have been relatively heavy. Mills, for the most part, are booked at capacity for some time ahead. In instances they refuse to quote on new business, particularly if early delivery is involved. There is no let up in the demand for shrapnel bars. One Eastern maker quoted on over 200,000 tons in one day last week. Some makers now quote only for immediate acceptance and subject to prior sale. For shrapnel steel 2½c. to 3c. at mill has been freely quoted. Ordinary steel bars are very firm at 1.30c., Pittsburgh, equal to 1.459c. here and makers contend that under existing conditions they will not take any business at lower figures. Iron bars have stiffened sharply and quotations are around 1.25c. mill.

**Billets.**—Heavy tonnages of billets for export are before the trade, but mill capacities have filled up so rapidly that the business is hard to place. Quotations have advanced to a point that makers get better figures from domestic buyers than foreign purchasers are willing to pay. Moderate lot sales of basic open-hearth rolling billets have been made at \$30 to \$32.50, delivered in this district, and that to regular customers only. Several round lot inquiries for rolling billets for export for commercial purposes have come out, but at least one of the leading Eastern mills has refused to quote. Forging billets command the usual advance of \$4 to \$6 per ton over rolling billets, dependent upon specifications.

**Rails.**—The largest order placed in this market was for 2200 tons for the Florida East Coast Railway, although orders for a number of small lots, bringing mill tonnage up to a fair average, are reported. An order for 150,000 kegs of spikes for shipment to Russia has been placed.

**Plates.**—A light demand for universal plates is still reported. Other classes of plates continue in active demand. Some mills are running up to 95 per cent of capacity and deliveries range up to four weeks. Good specifications for boat steel have come out, but no new inquiry has developed. Miscellaneous business has been in good volume and prices are firm. For third quarter delivery 1.459c., delivered here, is adhered to. Some few contracts for fourth quarter shipment have been entered at 1.509c., delivered.

**Structural Material.**—The demand is gradually broadening and mill activities are steadily increasing. The bulk of the business in this district has been of a miscellaneous character, although some good bridge orders have been closed, including one of 1000 tons for a bridge at Milton for the Reading Railway. Firmness in structural prices is not as apparent as in other lines. On miscellaneous business 1.459c., delivered here, is pretty generally adhered to, but on tonnage business 1.409c. could, no doubt, be done.

**Sheets.**—There is a good demand, and some of the leading Eastern mills have gone on full double turn. Prices are very firm at 1.559c. to 1.609c. for No. 10 blue annealed delivered in this vicinity.

**Coke.**—While there has been no large tonnage demand, the market gains in strength. Furnace coke is held at \$1.85 per net ton at oven, and is getting scarcer. Foundry coke contracts have been largely closed and the better grades are hard to get under \$2.75 at oven, although some are still available at \$2.60 to \$2.65. The market is steadily hardening and higher prices are looked for. Freight rates from the principal producing districts are as follows: Connells-ville, \$2.05; Latrobe, \$1.85; Mountain, \$1.65.

**Old Material.**—Buying in melting steel and rolling-mill grades has been more active and in many cases higher prices have been paid. On the other hand, the various classes of cast-iron scrap show little movement. Dealers are decidedly optimistic in their views, particularly regarding heavy melting steel, refusing to sell ahead at current prices; \$12.50 is freely paid for this grade and \$13 asked, but not much comes out. Little, except forced sales, is moved at lower figures. Steel axles have sold up to \$15.25, while No. 1 railroad wrought easily brings \$14. Bids of \$11.50 have been made for wrought pipe and up to \$13 is asked. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel.....	\$12.50 to \$13.00
Old steel rails, rerolling (nominal) ..	13.00 to 13.50
Low phos. heavy melting steel scrap.	15.25 to 15.75
Old steel axles.....	14.25 to 14.75
Old iron axles (nominal).....	18.00 to 18.50
Old iron rails (nominal).....	15.50 to 16.00
Old carwheels.....	12.50 to 13.00
No. 1 railroad wrought.....	14.00 to 14.25
Wrought-iron pipe.....	11.00 to 12.00
No. 1 forge fire.....	9.00 to 9.50
Bundled sheets.....	9.25 to 9.75
No. 2 busheling.....	7.75 to 8.25
Machine shop turnings.....	8.75 to 9.25
Cast borings.....	8.75 to 9.25
No. 1 cast.....	12.50 to 13.00
Grate bars, railroad.....	9.50 to 10.00
Stove plate.....	9.50 to 10.00
Railroad malleable (nominal).....	10.00 to 10.50

The Commonwealth Steel Company, Granite City, Ill., will start an additional steel furnace Aug. 1, increasing its working force by 900 men at the same time. A new rolling mill, with a capacity for rolling 50-in. plates, to cost about \$100,000, will be constructed and equipped at the same place by the National Enameling & Stamping Company. The American Car & Foundry Company, whose plant is in the same locality will increase its capacity and add considerable new equipment. Other reports from the district are that all plants will be working at full capacity within the next 60 days as the result of orders already received.

## Cleveland

CLEVELAND, OHIO, July 27, 1915.

**Iron Ore.**—The market is less active than during the previous two weeks, when considerable ore was sold. Some small lot sales are reported and some good size orders are in prospect. The volume of the season's business will be very satisfactory, even if no additional ore is sold. We quote prices as follows delivered at lower Lake ports: Old Range Bessemer, \$3.75; Mesaba Bessemer, \$3.45; Old Range non-Bessemer, \$3.00; Mesaba non-Bessemer, \$2.80.

**Pig Iron.**—Prices have stiffened in all grades. While most sellers are adhering to higher quotations, there are still a few weak spots in adjoining territories. The minimum price for Cleveland iron, which could be had at \$12.75 a week ago for No. 2, is now \$13 for outside shipment. Some Valley iron was sold in the week at \$12.75 but it is possible that the \$13 price could no longer be shaded. A fair volume of business is coming out in foundry grades for this year's delivery and the number of inquiries for iron for delivery after Jan. 1 has increased. Most producers are refusing orders for that delivery but some business has been taken for the first quarter at an advance of 25c. to 50c. over current prices. The Westinghouse Electric & Mfg. Company has purchased 5000 to 6000 tons of foundry iron for its Cleveland plant for the last half, the business being divided among Cleveland furnaces on the basis of \$13.50 delivered. A Toledo automobile company, whose inquiry for 15,000 tons of foundry and malleable iron was noted last week, has covered. Southern iron has also stiffened to \$10 as a minimum quotation by most, if not all producers, and some are asking \$10.50 for No. 2. No prices are being quoted as yet for next year's delivery. We quote delivered Cleveland as follows:

Bessemer .....	\$14.90
Basic .....	\$13.50 to 13.90
Northern No. 2 foundry .....	13.50
Southern No. 2 foundry .....	14.00
Gray forge .....	13.25
Jackson Co. silvery 8 per cent silicon .....	16.37 to 16.62
Standard low phosphorus at Valley furnace .....	20.50 to 21.00

**Coke.**—The market is firm but not active. An inquiry for 10,000 tons of furnace coke per month has brought out quotations of \$1.75 per net ton at oven for the third quarter and \$1.85 for the last quarter. Foundry coke is quoted at \$2.25 to \$2.50 for prompt shipment for the best makes and up to \$2.60 for contracts.

**Finished Iron and Steel.**—New demand is holding up well and specifications are heavy. Mills are so well sold up for the next few months that some do not care to take additional contracts. The slow delivery on steel bars has resulted in the placing of some orders for iron bars as a substitute. The 1.25c., Pittsburgh, price on steel bars and structural material has disappeared but plates can still be had from some of the smaller mills at 1.20c., Pittsburgh. Billets and sheet bars are higher. We note the sale of 1500 tons of Bessemer sheet bars at \$23, Youngstown, for August delivery and 2000 tons of open-hearth billets for the third quarter on the basis of \$23, Youngstown. Forging billets have sold as high as \$30.75, Pittsburgh. A Toledo architect has placed a contract for a warehouse in St. Paul requiring 2900 tons of structural material with the Minneapolis Steel & Machinery Company; Bethlehem sections will be used. An inquiry is out for 250 tons for a factory building for the Chandler Motor Car Company, Cleveland. Two ore unloaders for Conneaut will require 900 tons. Bids will be received July 29 for the deck of the superstructure of the Clark Avenue bridge, Cleveland, which will require 500 tons of reinforcing bars. The demand for sheets is fairly active, with prices unchanged at 1.80c., Ohio mills, for No. 28 black and 1.35c. to 1.40c. for No. 10 blue annealed. Prices on galvanized sheets are slightly easier, quotations ranging from 4.25c. to 5c. for No. 28. We quote iron bars at 1.15c., Pittsburgh. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

**Bolts, Nuts and Rivets.**—The demand for bolts and nuts on contracts is fairly heavy, particularly for the smaller sizes, and some of the makers are several weeks behind on deliveries. Prices are firm and some makers

are asking an advance of 5 per cent on bolts and \$3 a \$5 a ton on nuts over current quotations. Rivet prices are firm at 1.50c., Pittsburgh, for structural and 1.80c. for boiler rivets for third quarter delivery. Bolt and nut discounts are as follows: Common carriage bolts, 1/2 x 6 in., smaller or shorter, rolled thread, 75, 10 and 10 per cent; cut thread, 75, 10 and 10 per cent; larger or longer, 75 and 10 per cent; machine bolts with nuts, 1/2 x 4 in., smaller or shorter, rolled thread, 75, 10, 10 and 10 per cent; cut thread, 75, 10, 10 and 5 per cent; larger or longer, 75 and 15 per cent; coach and screws, 80 and 20 per cent; square h.p. nuts, blank or tapped, \$6.30 off; hexagon h.p. nuts, blank or tapped, \$7.10 off; c.p.c. and t-square nuts, blank or tapped, \$5.80 off; hexagon, 1/2 in. and larger, \$7.25 off; 9/16 and smaller, \$8 off; semi-finished hexagon nuts, 1/2 in. and larger, 85, 10 and 10 per cent; 9/16 and smaller, 85, 10, 10 and 10 per cent.

**Old Material.**—Scrap is being shipped to the mills faster than wanted and considerable material is being held on cars for some time until consumers are ready to take it. Mills in the Cleveland and Valley districts have bought heavily and are well supplied for the next few weeks but will buy for September delivery. Prices are firm for future shipment and dealers are not inclined to sell short, but on prompt shipment business the market is not firm. Prices on railroad wrought which have been particularly low, have been advanced. Other prices are unchanged. We quote, f.o.b. Cleveland as follows:

Per Gross Ton	
Old steel rails, rerolling .....	\$11.00 to \$11.75
Old iron rails .....	12.00
Steel car axles .....	12.75 to 13.00
Heavy melting steel .....	10.50 to 11.00
Old carwheels .....	9.75 to 10.00
Relaying rails, 50 lb. and over .....	22.50
Agricultural malleable .....	8.50
Railroad malleable .....	10.25 to 10.50
Steel axle turnings .....	8.75 to 9.00
Light bundled sheet scrap .....	8.00 to 8.50

Per Net Ton	
Iron car axles .....	\$14.00 to \$14.50
Cast borings .....	6.00 to 6.50
Iron and steel turnings and drillings .....	5.50 to 6.00
No. 1 busheling .....	8.50 to 8.75
No. 1 railroad wrought .....	9.75 to 10.00
No. 1 cast .....	9.75 to 10.25
Stove plate .....	8.00 to 8.25

## Cincinnati

CINCINNATI, OHIO, July 28, 1915.—(By Wire.)

**Pig Iron.**—The demand for foundry pig iron has eased off somewhat, as users in this territory are fairly well provided for, as far as this year's requirements are concerned. If exact figures were obtainable, the total tonnage placed in the first three weeks of July would exceed the largest estimates made by different merchants. A number of foundries bought for last quarter shipment enough iron to run them through the first quarter of next year. A local consumer has booked 500 tons of Southern iron for last half delivery and in spite of the lull the latter part of last week there were quite a number of orders placed, running from a carload to 300 tons. An Indiana melter took approximately 800 tons of mixed Northern and Southern grades. Southern foundry iron is firm at \$10, Birmingham basis, and a few makers are asking \$10.50. No quotations are out for either the first or second quarter of next year. Northern foundry and basic have advanced to \$13, Iron- ton, the same figure governing on shipments at any time during the present year and one interest in quoting beyond this delivery, on a basis of \$13.25 for the first quarter and \$13.50 for the second quarter of 1916. The silvery irons are firmer and \$15 at furnace, based on an 8 per cent analysis, is now quoted for either prompt or last quarter shipment. A number of medium-sized tonnages have been sold lately. A steel maker in this territory recently bought about 10,000 tons of Northern basic pig iron for shipment in the early part of next year and it is rumored another mill is on the verge of closing for a round lot for first half delivery. A large Ohio manufacturer has been inquiring for approximately 35,000 tons of mixed basic, foundry and silvery irons, part of which has been purchased. About 5000 tons of the inquiry was for silvery iron, all for first half shipment. A Michigan smelter bought 700



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ons of Lake Superior charcoal iron for shipment in the remainder of the year. Ashland furnace will blow on Aug. 1. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	\$13.40 to \$13.90
Southern coke, No. 2 f'dry and 2 soft.	12.90 to 13.40
Southern coke, No. 3 foundry.	12.40 to 12.90
Southern No. 4 foundry.	11.90 to 12.40
Southern gray forge	11.40 to 11.90
Ohio silvery, 8 per cent silicon.	16.26 to 16.41
Southern Ohio coke, No. 1.	15.26 to 15.76
Southern Ohio coke, No. 2.	14.26 to 14.76
Southern Ohio coke, No. 3.	14.01 to 14.26
Southern Ohio malleable Bessemer.	14.26 to 14.51
Basic, Northern.	14.26 to 14.51
Lake Superior charcoal	16.20 to 17.20
Standard Southern carwheel	26.90 to 27.40

(By Mail)

**Finished Material.**—The galvanized sheet situation is yet somewhat puzzling, as local warehouse quotations on No. 28 are from 4.50c. to 5c., Cincinnati, while mill prices are the same on a Pittsburgh basis. However, there is understood to be only a small quantity of sheets in stock locally, although Chicago competition is also a factor to be reckoned with in a limited way in this territory. Black sheets are firmer, and mill prices are now 1.90c., Pittsburgh, or 2.058c., Cincinnati, but warehouse quotations are from 2.20c. to 2.30c., Cincinnati. The local store quotation on steel bars from stock is 1.80c., with the usual advance for twisted concrete bars. Some business is being transacted, but it is not up to normal in reinforcing bars. Railroad track material is still improving. Retailers report a large demand lately for wire roofing nails.

**Coke.**—Advances made by both furnace and foundry producers appear to be well maintained, and a number of oven operators in both the Connellsville and Virginia districts, who were previously willing to take on business at minimum quotations, have now marked up their prices. In this territory there is no furnace coke business in sight, and, due to previous heavy contracting, it is quite probable that foundry coke will also be dull for some time. There are fewer complaints now as to holding up shipments for either furnace or foundry coke. We quote Connellsville 48-hr. coke for prompt shipment around \$1.70 per net ton at oven, with contract prices ranging from \$1.75 to \$1.80 for this year's shipment and around \$2 for next year's delivery. There is a wide range in the quotations of both Connellsville and Virginia foundry coke but from \$2.25 to \$2.60 per net ton at oven fairly represents the situation.

**Old Material.**—Prices continue to advance on nearly all grades of scrap. Quite a large tonnage has been bought and sold by local dealers lately, and, taken as a whole, there is a marked improvement over the situation at this time last year. Both the rolling mills and foundries have been buying quite freely lately, and there is more business in sight. The minimum figures given below represent what dealers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton	
Bundled sheet scrap.	\$7.75 to 8.25
Old iron rails	11.00 to 11.50
Relaying rails, 50 lb. and up.	19.75 to 20.25
Re-rolling steel rails	9.50 to 10.00
Heavy melting steel rails	9.00 to 9.50

Per Net Ton	
No. 1 railroad wrought	\$9.00 to \$9.50
Cast borings	5.50 to 6.00
Steel turnings	5.25 to 5.75
Railroad cast scrap	9.75 to 10.25
No. 1 machinery cast scrap.	11.00 to 11.50
Bunt scrap	7.00 to 7.50
Old iron axes	14.00 to 14.50
Locomotive tires (smooth inside)	9.00 to 9.50
Pipes and flues	6.50 to 7.00
Malleable and steel scrap	7.75 to 8.25
Railroad tank and sheet scrap.	5.75 to 6.25

The United Furnace Company, Canton, Ohio, which is being organized by the combined interests of Pickands, Mather & Co., Cleveland, and the United Steel Company, Canton, to build a blast furnace in connection with the steel plant of the United Steel Company, has been incorporated with a capital stock of \$2,000,000 by H. G. Dalton, H. S. Pickands, E. A. Langenbach, Harry R. Jones and E. L. Hang.

## Birmingham

BIRMINGHAM, ALA., July 26, 1915.

**Pig Iron.**—Although the majority of makers admit but small sales, they are holding firmly to a minimum of \$10 on standard grades for the remainder of the year, with one interest asking \$10.50. There is a small quantity of off-grade iron, low in silicon, which can be had at \$9.75, but this deficiency always causes a drop of 25c. per ton with the shrewd buyer. Some items of the situation are these: One producing company, with two active stacks, has, counting stocks on hand, orders sufficient at its present output to last it for the remainder of the year, besides being scantily provided with No. 2 soft and other grades. The interest with the largest accumulations is that which has sold 100,000 tons within two months and has advanced to \$10.50, having protected itself, stocks and all, considerably into the future. A leading interest's stocks of foundry are at what is known as the danger line, and is operating but two stacks on foundry. Still another, which furnishes its pipe shop with metal, is well taken care of for several months ahead. These are the conditions which make for a firm market and a hardening of prices. Offers of contracts for 1500 tons of No. 2 soft and other grades at \$10 were declined by an interest which could not fill them. A firm offer of 4000 tons for the remainder of the year at \$10 was declined by an interest which has advanced quotations. Speculators who offered \$9.75 have been turned down. Makers who mention speculators aver that they made no sales to them, although they say as high as \$10 was offered. One of the most encouraging features of the market is the very recently resumed activity at machine shops. A Bessemer foundry is operating double turn on sugar house machinery. A large local shop is running 22 hours per day on chemical apparatus and sugar machinery for Cuba and other Latin American countries, while two other very large shops report a steady business in engines both for domestic and foreign trade, together with Government contracts for Montana and Washington. One machine shop has doubled its force of men the past week. All are buying iron at \$10. The consumption of basic iron at home has greatly increased. There is some talk of securing war munitions contracts, but that seems unlikely, owing to unpreparedness to handle them. We quote, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft.	\$10.25 to \$10.50
No. 2 foundry and soft.	9.75 to 10.00
No. 3 foundry	9.25 to 9.50
No. 4 foundry	9.00 to 9.25
Gray forge	8.75 to 9.00
Basic	9.75 to 10.00
Charcoal	21.00 to 21.25

**Cast-Iron Pipe.**—The manufacture of water and gas pipe is on a large scale with the active plants. The National, at Birmingham, has orders to capacity for some time ahead, is shipping on a large California order and expects to book some proffered export business. It is believed that the United States Company will be able to resume at Bessemer, where extensive improvements are being made, some time next month. Its plant in Birmingham is also ready for operation. The sanitary pipe trade is listless. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., \$20.50; 6-in. and upward, \$18.50, with \$1 added for gas pipe.

**Coal and Coke.**—Increase in foundry activity has caused an active demand for the higher grades of coke, the far West and Texas being good takers as well as nearby Southern foundries. We quote, per net ton, f.o.b. oven, as follows: Beehive foundry, \$3 to \$3.25; beehive furnace, \$2.50 to \$2.75; by-product, \$2.25 to \$2.50, with some makes higher. The Sloss-Sheffield Company has renewed its coal contract for 150,000 tons with the Georgia, Florida & Southern. Favorable reports have been made in the Alabama Legislature to abolish the convict lease system, effective January, 1918, and it now appears that the bill will pass. Mines are somewhat more active than during the past several months.



**Old Material.**—Scrap dealers report a much more optimistic feeling with regard to the future, but say the volume of actual business has increased only slightly. Prices are maintained with somewhat greater regularity and the immediate prospect is that they will harden. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles .....	\$13.00 to \$13.50
Old steel axles .....	12.50 to 13.00
Old iron rails .....	12.50 to 13.00
No. 1 railroad wrought .....	8.50 to 9.00
No. 2 railroad wrought .....	7.50 to 8.00
No. 1 country wrought .....	8.00 to 8.50
No. 1 machinery cast .....	8.25 to 8.50
No. 1 steel scrap .....	8.00 to 8.25
Tram carwheels .....	8.25 to 8.50
Stove plate .....	7.00 to 7.50

## St. Louis

ST. LOUIS, Mo., July 26, 1915.

**Pig Iron.**—No. 2 Southern has been quoted at \$10 to \$10.50 per ton, Birmingham. Sales have ranged from carload lots up to as high as 500 tons for last half delivery, and the aggregate has been quite heavy.

**Coke.**—Activity confined itself to by-product material, with the new local plant conspicuous in the competition. There is a well substantiated feeling that \$4.50 delivered St. Louis is being made or would be made on attractive tonnage.

**Finished Iron and Steel.**—Railroads are reported as beginning to figure on material. Track fastenings are in fair demand and light rails are moving a little better. Agricultural and vehicle interests are taking quite freely. Movement out of stock is increasing rapidly and warehousemen quote as follows for their material: Soft steel bars, 1.70c.; iron bars, 1.65c.; structural material, 1.80c.; tank plates, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, black sheet gage, 4.85c.

**Old Material.**—There has been some further advance in prices, though the changes are largely due to dealers' transactions and to the demands from the North and East. Altogether the situation is regarded optimistically by the local dealers. We quote dealers' prices f.o.b. St. Louis as follows:

Per Gross Ton	
Old iron rails .....	\$11.00 to \$11.50
Old steel rails, re-rolling .....	11.25 to 11.75
Old steel rails, less than 3 ft. ....	11.25 to 11.75
Relaying rails, standard section, subject to inspection .....	22.00 to 23.00
Old carwheels .....	10.25 to 10.75
No. 1 railroad heavy melting steel scrap .....	10.50 to 10.75
Shoveling steel .....	9.25 to 9.50
Frogs, switches and guards cut apart .....	10.50 to 10.75
Bundled sheet scrap .....	6.50 to 6.75

Per Net Ton	
Iron fish plates .....	\$10.50 to \$11.00
Steel angle bars .....	9.25 to 9.50
Iron car axles .....	15.00 to 15.25
Steel car axles .....	11.50 to 11.75
Wrought arch bars and transoms. ....	12.50 to 13.25
No. 1 railroad wrought .....	9.50 to 9.75
No. 2 railroad wrought .....	9.00 to 9.25
Railroad springs .....	9.50 to 9.75
Steel couplers and knuckles .....	9.50 to 9.75
Locomotive tires, 42 in. and over, smooth inside .....	10.00 to 10.25
No. 1 dealers' forge .....	8.50 to 8.75
Mixed borings .....	5.75 to 6.00
No. 1 busheling .....	8.00 to 8.25
No. 1 boilers, cut to sheets and rings. ....	6.25 to 6.75
No. 1 railroad cast scrap .....	8.50 to 9.00
Stove plate and light cast scrap. ....	7.25 to 7.50
Railroad malleable .....	7.75 to 8.00
Agricultural malleable .....	6.75 to 7.00
Pipes and flues .....	7.00 to 7.25
Railroad sheet and tank scrap. ....	6.75 to 7.00
Railroad grate bars .....	6.75 to 7.00
Machine shop turnings .....	6.50 to 6.75

The property of the United States Metal Products Company, bankrupt, will be sold at public sale August 2 at 11 a. m. in room 915, 32 Liberty Street, New York, by the referee, John J. Townsend, under a decree of sale issued by the United States District Court for the Southern District of New York. The property of this company is mainly located at College Point, Long Island, comprising a large factory for the manufacture of metal doors, window frames, sash and interior finishing.

## New York

NEW YORK, July 28, 1915.

**Pig Iron.**—Increasing firmness in prices of pig iron is noticed, but without change in the quotations of furnace companies which announced higher prices for forward delivery a few weeks ago. In the Buffalo district it is understood that one company which has been selling at \$12.25 to \$12.75 has been quoting \$13 recently and the impression is thus given that all Buffalo furnaces are now on that level. Reports continue, however, of figures less than this for No. 2 X foundry. New England foundries which have to do with textile machinery have been running at a fair rate, and these and some foundries serving the machine tool trade make favorable reports of their business. The New England stove trade and the manufacturers of radiation and boilers for heating plants are generally running at 50 per cent, which is the rate maintained for some months. In this district a 5000-ton inquiry has come up this week. One for 2500 tons has also been reported, but this was for a Western plant and would not ordinarily receive the attention of the New York trade. Sales in lots of several hundred tons are reported, including one of 500 tons and one of 600 tons. From New Jersey an inquiry has come for 1000 tons of low silicon iron. The same buyer took 2000 tons of high silicon iron a few weeks ago and 1000 tons of iron of like analysis ten days ago, these orders going to eastern Pennsylvania. Virginia iron is on a \$12.50 basis for No. 2 X, but few recent sales are reported. Inquiry is still received for Bessemer iron for Italy. Probably 15,000 to 20,000 tons has been sold for shipment to Italian ports in the past two months. We quote at tidewater as follows: No. 1 foundry, \$14.50 to \$14.75; No. 2 X, \$14.25 to \$14.50; No. 2 plain, \$13.75 to \$14; Southern iron, \$14.50 to \$14.75 for No. 1 and \$14.25 for No. 2.

**Ferroalloys.**—Drastic restrictions in British shipments of ferromanganese are announced by local representatives of British producers. August consignments are either abandoned or cut down so sharply as to be a mere bagatelle and dealers here are told to make no sales or contracts for future delivery. While a respectable tonnage is still afloat, September receipts will be very much less than for some time, while the August tonnage arriving will not equal that of any of the last three months. Dealers say they are in the dark as to the cause of the virtual embargo except on the ground that Great Britain is conserving its supply. Sales of at least 1000 tons have been made recently at \$100, seaboard. Inquiry from the rank and file of consumers is more insistent; their stocks are believed to be low. Supplies in the hands of most of the larger consumers here are regarded as sufficient by some and by others as becoming low, especially in view of the large recent increase in steel production. It is pointed out that receipts for the first half of this year have not exceeded 21,000 gross tons, while the average importations for the last five years have been over 50,000 tons in six months. The recent announcements of possible restrictions have caused an increasing anxiety. An advance in price is looked for. Activity on the part of domestic producers is not so marked. Ferrosilicon, 50 per cent, is still very active, both for domestic and foreign consumption, at \$71 to \$73, Pittsburgh.

**Structural Material.**—Some disappointment is expressed that more structural building projects have not been brought to an issue with the advances in price of plain material. Quotations are now generally 1.30c., Pittsburgh, for prompt shipments, though 1.25c. is regarded as still obtainable on attractive lots. In view of the fact that the strength of structural material is considered due to scarcity of steel rather than to demand for shapes, a definite betterment is indicated in that mills somewhat independent of general heavy steel buying are not able to make as early shipments as formerly. Outside of inquiry for apartment houses and some loft buildings and for war munitions factories, fabricated work is not particularly promising and railroad bridges are not expected in any quantity before.

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November, after the financial status of the railroads is ascertained. Some further requirements for the New York City transportation lines are noted in 2,000 tons for the third tracking of Myrtle Avenue, Brooklyn, for the New York Municipal Railways, this, with the Culver Line work mentioned last week, making a total of about 40,000 tons. Persistent claims are made that the Bethlehem Steel Company has taken the steel building work, 3,600 tons, for the Albemarle Building on the Hoffman House site, but this the company vehemently denies. The Hedden Iron Construction Company has been awarded 900 tons for the Murray Hill Building, Thirty-eighth Street to Thirty-ninth Street, and 750 tons for the Empire Floor Tile Company, Metuchen, N. J. The American Bridge Company has taken 800 tons for the New Jersey Zinc Company at Franklin Junction (the Phoenix Bridge Company taking about 600 tons), 300 tons for stock pens for the Pennsylvania Railroad at Pittsburgh and 700 tons for the Rice office building at Boston. The Pittsburgh Bridge & Iron Company has been awarded 500 tons for a fertilizer plant for G. Ober & Sons, Baltimore; Terry & Tench Company, 300 tons for a nine-story building, 22 West Forty-sixth Street; the Eastern Bridge & Structural Company, Worcester, 150 tons for the Mohawk Hotel, Schenectady, and Dietrich Brothers, 300 tons for the National Savings & Trust Company addition, Washington, D. C. The railroad work in the market is represented chiefly by 1,500 to 1,600 tons for two bridges at Milton, Pa., for the Philadelphia & Reading, 300 tons for the Erie at Jamestown, N. J., and 350 tons for three bridges for the New York, Ontario & Western. For 1,600 tons at the Panama Canal, the Pennsylvania Steel Company is low on a delivered basis and the American Bridge Company low on an erected basis. Besides 1,000 tons for the Franklin National Bank, Philadelphia, not heretofore mentioned, little building work of size has come into the market. We quote mill shipments at 1.25c., Pittsburgh, or 1.419c., New York, for attractive lots but 1.30c., Pittsburgh, or 1.469c., New York, for the usual order of business. For small lots from store we quote 1.95c. to 2c., New York.

**Steel Plates.**—The market is still 1.20c., Pittsburgh, except for immediate shipment orders, when 1.25c. and higher is ordinarily obtained. Some surprise is shown that in a few cases even the somewhat emergency kind of buying has not commanded more than 1.20c. basis. With the continued activity of shipping in New York harbor and the low demand from shipyards, it is regarded as convincing that the higher labor rates and fewer working hours here are sending ship repair work, except the smaller jobs, to other Atlantic yards, a fact which has been commented on for some years and which has resulted in this center being a small consumer of ship plates. The export situation is interesting in that inquiries covering plates have been received, as from Italy, for such finished forms as complete marine boilers. Domestic consumption for railroad cars is still waiting on a final expression from three or four roads which have been quietly making inquiries. Including 830 box cars for the Atlantic Coast Line, the latest tender for bids, there are hardly 2,000 cars and 2,500 underframes under definite consideration. We quote 1.20c. to 1.30c., Pittsburgh, or 1.369c. to 1.469c., New York, the higher figures being charged for the smaller lots and for fourth quarter. Plates from store are 1.95c. to 2c., New York.

**Steel and Iron Bars.**—No quotations below 1.30c., Pittsburgh, are noted for steel bars and the market is strong with deliveries not promised in some cases within two months. Demand for steel for high explosive and other shells is the predominant factor. Bar iron appears to be holding strong at 1.20c. at mill for prompt business, with \$1 a ton commonly added for future deliveries. We quote mill shipments of steel bars at 1.30c., Pittsburgh, or 1.469c., New York, and refined iron bars 1.30c. to 1.35c., New York. Out of store in New York iron and steel bars are 1.90c. to 1.95c.

**Cast-Iron Pipe.**—Public lettings are quiet, nothing new of importance having come out in the past week.

The United States Cast Iron Pipe & Foundry Company was the successful bidder on 615 tons of 10-in. at Ilion, N. Y., and R. D. Wood & Co. were low bidders for 1,370 tons of 4 to 10-in. for Totowa, N. J., naming \$22.75 per net ton, delivered. Private buying keeps up well, but no large quantities are being taken at present. Export business continues to come up. One inquiry has been received from South Wales for 10,000 tons of various sizes, running from 6 to 33-in. Some sizes have not hitherto been made in this country, but the required conditions could be met with some little special preparation. The tendency of prices is upward, but carload lots of 6-in. class B and heavier, can still be had at \$22.50 to \$23 per net ton tidewater, class A, and gas pipe taking an extra of \$1 per ton.

**Old Material.**—The market is much more active, all kinds of scrap participating in the better trade. Some round lots of heavy melting steel scrap have been sold, and business of this character would probably have been larger if holders were not so strongly inclined to wait for still better prices. It is understood that a considerable quantity of old steel axles has been sold for export. Prices are firm, with an upward tendency. Brokers are paying about as follows to local dealers and producers, per gross ton, New York:

Old girder and T rails for melting	\$10.00 to \$10.25
Heavy melting steel scrap	10.00 to 10.25
Relaying rails	19.00 to 19.50
Rerolling rails	10.25 to 10.75
Iron car axles (nominal)	15.25 to 15.75
Steel car axles	12.75 to 13.00
No. 1 railroad wrought	11.25 to 11.75
Wrought-iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.25 to 10.75
No. 1 yard wrought, short	9.75 to 10.25
Light iron (nominal)	3.25 to 3.75
Cast borings	6.50 to 6.75
Wrought turnings	6.50 to 6.75
Wrought pipe	8.75 to 9.25

Foundries are becoming more liberal buyers of cast scrap. Dealers' quotations to consumers of cast pipe are as follows, per gross ton, New York:

Old car wheels	\$10.00 to \$10.50
No. 1 machinery cast	11.75 to 12.25
No. 2 heavy cast	10.25 to 10.75
Stove plate	8.75 to 9.00
Locomotive grate bars	7.50 to 8.00
Malleable cast	8.00 to 8.50

## Buffalo

BUFFALO, N. Y., July 27, 1915.

**Pig Iron.**—All furnaces in this district are now holding to \$13 as minimum base for all grades and are maintaining more rigid differentials between grades. Between 14,000 and 15,000 tons of foundry and malleable grades have been bought in the week and a considerable tonnage of basic. Inquiry is keeping up in good volume for the midsummer season. Most of the foundries of the district are becoming increasingly busy, steel foundries in particular, and also malleable foundries. Some of the steel foundries reporting exceptional activity are the Atlas Steel Castings Company, the Strong Steel Foundry, the Pratt & Letchworth Company, the Acme Steel & Malleable Iron Works, the Johnston Harvester Company, Batavia, and the Syracuse Malleable Company, Syracuse. We quote for last half delivery, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry	\$13.25 to \$13.50
No. 2 X foundry	13.00 to 13.25
No. 2 plain	13.00
No. 3 foundry	13.00
Gray forge	13.00
Malleable	13.00 to 13.25
Basic	13.25 to 13.75
Charcoal, regular brands and analysis	15.75 to 17.25
Charcoal, special brands and analysis	19.00 to 20.00

**Finished Iron and Steel.**—Mills and agencies report mill capacity as pretty well sold up for the remainder of the year. The larger users of steel, realizing the situation, are coming in with orders and specifications; but many of the smaller users are loath to take the advice of mill representatives. Mills and agencies report that there is a noticeable increase in the percentage of orders for purely domestic uses. New orders are not being taken at less than 1.30c., Pittsburgh, for immediate specification and shipment. Deliveries in cold-



rolled steel are more extended than in other principal steel lines. The demand for bolts is increasing and prices have a stiffening tendency; some bolt manufacturers have advanced their prices on large carriage, large machine and coach screws 5 per cent. The Buffalo Bolt Company, North Tonawanda, is building plant extensions for producing its own bars. General business conditions in Canada are improving. The Paige-Hersey Tube Company is arranging to start up its tube works at Guelph, which have been shut down for some time. One Canadian interest has recently visited the Buffalo market for 3000 tons and upward of billets, but was unable to place the order here. Contract has been let for a 150 x 600 ft. building of reinforced concrete for the Sun Motor Car Company, Buffalo. The Lackawanna Steel Company is now operating to the limit of ingot capacity. It now has 14 open-hearth furnaces in operation and 2 tilting, with 4 additional open-hearth furnaces approaching completion.

**Old Material.**—Heavy melting steel has been in heavy demand and prices have advanced 25c. to 50c. per ton. Low phosphorus has experienced a revival and prices have advanced \$1.50 per ton. Inquiries from out of town and increased consumption by local plants have caused the rise. As is generally the case in a market condition of this kind dealers are chary regarding selling more than very limited quantities, expecting that the market will continue to advance. Old steel axles are also active and have advanced \$1 per ton. Other commodities, although dealt in quite freely, show no quotable change in price. We quote dealers' asking prices per gross ton, f.o.b., Buffalo, as follows:

Heavy melting steel .....	\$11.00 to \$11.50
Low phosphorus steel .....	14.50 to 15.00
No. 1 railroad wrought scrap .....	10.50 to 11.00
No. 1 railroad and machinery cast .....	11.00 to 11.50
Old steel axles .....	13.00 to 13.50
Old iron axles .....	16.00 to 16.50
Old carwheels .....	11.50 to 12.00
Railroad malleable .....	10.50 to 11.00
Machine shop turnings .....	5.75 to 6.25
Heavy axle turnings .....	8.50 to 9.00
Clean cast borings .....	6.75 to 7.00
Old iron rails .....	11.00 to 11.50
Locomotive grate bars .....	9.00 to 9.50
Stove plate (net ton) .....	8.25 to 8.75
Wrought pipe .....	7.00 to 7.50
Bundled sheet scrap .....	7.25 to 7.75
No. 1 busheling scrap .....	8.50 to 9.00
No. 2 busheling scrap .....	6.50 to 7.00
Bundled tin scrap .....	9.00

## Ferromanganese Restricted

### British Producers Ordered to Conserve Stocks— One Maker Out of Export Material

(By Cable)

LONDON, ENGLAND, July 28, 1915.

Ferromanganese makers have been officially instructed to hold three months' output in stock and also three months' manganese ore requirements and consumers to hold in reserve three months' requirements of the alloy for the duration of the war as well as to also make monthly returns of consumption of stocks. The government has not interfered with prices. One producer has issued a notice that he is unable to deliver material for export owing to the scarcity of manganese ore.

The pig-iron market is quiet and featureless, but makers continue in a strong position and unwilling to commit themselves far ahead. Hematite pig iron is quiet, but a serious shipping strike is threatened at Bilbao, Spain, which is expected to interrupt ore shipments. The 10,000 tons of rails for West Australia was booked by the Broken Hill Proprietary Company and not by American producers as cabled last week. Stocks of pig iron in Connal's stores were 144,790 tons at the end of last week as compared with 146,414 tons one week previous. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 19s. (\$4.62).
Cleveland pig-iron warrants, 66s. 4½d. (\$16.15), against 66s. 7d. (\$16.20) last week.
No. 3 Cleveland pig iron, maker's price, f.o.b. Middles-

brough, 66s. 6d. (\$16.18), against 66s. 9d. (\$16.24) a week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, 111 15s. (\$37.18).

Steel ship plates, Scotch, delivered local yards, 19 11s. (\$47.44), against £10 (\$48.66) a week ago.

Steel rails, export, f.o.b. works port, £8 17s. 6d. (\$42.19).

Hematite pig iron, f.o.b. Tees, 95s. (\$23.12), compared with 96s. (\$23.36), last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 10s. (\$36.49).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £10 (\$48.66).

Steel bars, export, f.o.b. Clyde, £10 15s. (\$52.31).

Ferromanganese, f.o.b., £20 15s. (\$100.98).

Ferrosilicon 50 per cent, c.i.f., £15 5s. (\$74.21).

### Tin-Plate Competition from America—The Embargo Muddle on High-Speed Steels

(By Mail)

LONDON, ENGLAND, July 14, 1915.

The pig-iron market tends to firmness, assisted by the shutting down of some furnaces which have hitherto been engaged upon the production of Cleveland foundry material. There has since been some hesitation. Things really are very indifferent and it is increasingly difficult for manufacturers to see their way ahead. As soon as one difficulty is out of the way another one crops up, and the results of the indescribable muddle have never been more strikingly exemplified than in the past few months. In the feverish scramble now on all industrial establishments are being placed more and more in a state of chaos. Most works are running to an increasing extent on government requirements with all merchant and commercial business thrown out of joint. There is very little hope now of even passably decent commercial conditions until the end of the war is in sight. The tonnage of merchant iron and steel is becoming smaller and in a few months its production may cease altogether. Every possible obstacle is being put in the way of industrial operations, and not the least of the difficulties is that connected with labor. All the best men went to the war months ago, and those that are left are mostly wasters and bounders, who, encouraged by their labor representatives in Parliament, are bent upon doing as little work and making the greatest possible demands in wages.

Little is done in semi-finished steel, trade being very much cut down because of the practical suspension of operations at the galvanized sheet works, while tin-plate business is steadily decreasing, and a number of the works are now being run on munitions orders. The tin-plate trade is a little easier, though it is difficult to make any quotable alteration. There is considerable talk of growing and aggressive competition from the United States, which is making people feel uneasy here. There can be no doubt that the whole of the South American business is being taken by the United States, and there seems, also, to be a very fair amount of business going to America from France and from neutral countries. In finished steel there is not much change in the position, and output is being lessened in merchant material by the necessity of Government work.

#### THE HIGH SPEED STEEL MUDDLE

The decision of the Admiralty to prohibit exports of high grade steel containing ferroalloys gave the market a shock, and the decision was carried out with a stupidity which seems incredible. It will hardly be believed, but it is a fact, that consignments of Welsh tin plates were held up by the authorities on the ground that they contained tungsten and molybdenum. I believe some of them were eventually released after about a dozen people had made affidavits that these particular parcels did not contain such alloys, while it is currently reported that a consignment of high speed steel for one of the allies was also held back. A steel committee has now been appointed, with headquarters at Cutlers' Hall, Sheffield, and applications to export high grade steel containing ferroalloys must be made to this body, which is empowered to grant export certificates acceptable by the customs authorities. Similar



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committees will probably also be appointed at Newcastle-on-Tyne and Glasgow. Meantime, the wisdom of the authorities is strikingly exemplified in that they are now holding up hoop iron, hammers, wrought-iron bars, checker-plates, joists and other such material on the ground that they are high speed steel.

## Metal Market

NEW YORK, July 28, 1915.

### The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York	Lake	Electrolytic	Tin, New York	Lead		Spelter	
					New York	St. Louis	New York	St. Louis
				36.87½	5.50	5.45	20.00	19.75
				36.87½	5.50	5.45	19.75	19.50
				36.50	5.50	5.45	19.50	19.25
				36.21½	5.50	5.45	19.25	19.00
				36.12½	5.50	5.45	18.75	18.50
				36.00	5.50	5.45	18.25	18.00

Quotations on electrolytic copper are lower but nominal. Tin is declining with the market dull. Resale lots dominate lead prices. Spelter continues quiet and lower. Antimony is unchanged.

### New York

**Copper.**—While buying is at a low ebb consumption continues on a large scale. There is no new business and the market has been continually sagging. Demand from any source is lacking and prices are therefore nominal. High grade Lake is still quoted at 22c. with little demand. Electrolytic is quoted at 18.50c. A report was current last week that 1000 tons of electrolytic was sold at 20c. The price, however, discredited the rumor for the metal could easily have been bought then at 19.50c. to 19.75c. Without question there are still large amounts of copper to be purchased for munitions but buyers are cautious and proceeding slowly. A rally may be expected when these buyers come in, until which time the market is likely to continue dull. Since normal peace business is not up to the mark it is hard to hold the market steady. The exports this month are 13,010 tons, which is nearly double that reported a week ago.

**Tin.**—The market is weak and very dull. Scarcely any activity has been manifested in a week. What little business has been done is for spot material. For future shipment from the Straits some very attractive offers have been made but they did not appeal to buyers. The belief is growing that the large independent consumers or tin-plate makers have covered their requirements for 1915. A larger business was probably done in the latter part of May and in June than was thought. These facts explain the present dullness in part at least. Consumption however is on a large scale. Arrivals this month total 3439 tons with 5215 tons afloat. The price yesterday was 36c.

**Lead.**—No improvement is apparent and the easy tone of last week continues. Resale lots rule the market. Deliveries on old contracts by the leading interest are so extensive that consumers do not know what to do with supplies which is resulting in resales. Demand is light and the absorption of these lots is difficult. With buyers absent the bullish contingent admit a radical change in conditions. The exports this month are 2169 tons. Quotations yesterday were 5.50c., New York, and 5.45c., St. Louis.

**Spelter.**—Inactivity still characterizes the market. The nominal prices have continued to decline. The weakness is attributed to the known increase in production, which is said to be 100,000 tons per year greater than at the beginning of the year. The falling off in domestic demand by the substitution of black and other sheets for galvanized is not without its effect. Brass mill special grades are still hard to get at 30c. Quotations yesterday on prime Western were 18.50c., New York, and 18.25c., St. Louis. Exports so far this month total 4091 tons, which is low in comparison with any other month since September, 1914.

**Antimony.**—Chinese and Japanese grades range from 35.25c. to 36.25c., duty paid. The market is easy.

Considering the weakness in other metals its firmness is noticeable especially in view of the fact that this metal has advanced more than any other since the war began.

**Old Metals.**—The market is stagnant. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	17.00 to 17.50
Copper, heavy and wire	16.50 to 17.00
Copper, light and bottoms	15.00 to 15.50
Brass, heavy	12.50 to 13.00
Brass, light	9.50 to 10.00
Heavy machine composition	13.50 to 14.00
No. 1 yellow rod brass turnings	13.50 to 14.00
No. 1 red brass or composition turnings	12.00 to 12.50
Lead, heavy	5.00
Lead, tea	4.75
Zinc, scrap	13.00

### Chicago

**JULY 26.**—A general softening of metal prices is noted. Copper consumers appear to be well supplied and the smaller producers are shading prices. Spelter quotations are lower. Scrap metals are bringing out considerably lower offers. We quote: Casting copper, 18.75c.; Lake copper, 19c. to 19.25c.; tin, carloads, 37c.; small lots, 42c.; lead, 5.50c. to 5.60c.; spelter, nominally, 19c.; sheet zinc, nominally, 27c.; Cookson's antimony, 47.50c. to 50c.; other grades, 38c. to 39c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 15c.; copper bottoms, 14c.; copper clips, 14.75c.; red brass, 12c.; yellow brass, 11.75c.; lead pipe, 4.50c.; zinc, 11c.; pewter, No. 1, 25c.; tinfoil, 33c.; block tin pipe, 32c.

### St. Louis

**JULY 26.**—The market for non-ferrous metals has been unsettled. Spelter is quotable to-day at 21c.; lead, 5.50c.; tin, 38.50c.; Lake copper, 19c.; electrolytic copper, 18.50c.; antimony, 40c. In the Joplin ore market the range for the week was from \$90 to \$115 per ton for 60 per cent with the settlement on premium grades at \$118. On calamine the range was from \$50 to \$80 for 40 per cent. Lead ore was quiet at \$60 for 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 9c.; heavy yellow brass, 10c.; heavy red brass and light copper, 12c.; heavy copper and copper wire, 15c. to 15.50c.; pewter, 24c.; tinfoil, 31c.; zinc, 12c.; lead, 4.50c.; tea lead, 2.75c. to 3.25c.

## Iron and Industrial Stocks

NEW YORK, July 28, 1915.

Speculation in the so-called munitions stocks has continued to be the leading feature of the market in securities. Some of these stocks had attained dizzy altitudes when a severe shock was given to speculators by the sinking of the American steamship Leelanaw by a German submarine on Monday. A sharp decline took place, accelerated by the catching of stop loss orders, but the advance was resumed and higher figures were reached on Tuesday. It is interesting to note that in the general advance in the past week the stocks of the various steel companies participated to a marked extent. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	20½ - 24¾	Pressed Stl., pref.	99½
Allis-Chal., pref.	62 - 68¼	Ry. Steel Spring, com.	32½ - 36¾
Am. Can. com.	54½ - 61¾	Ry. Steel Spring, pref.	88½ - 91
Am. Can. pref.	104¼ - 106	Republic, com.	34½ - 37¾
Am. Car & Fdy., com.	55 - 57½	Republic, pref.	91 - 93¾
Am. Loco., com.	48 - 53½	Rumely Co., com.	2½ - 4
Am. Loco., pref.	95½	Rumely Co., pref.	9¼ - 9½
Am. Stl. Edries.	39 - 41¾	Sloss, com.	37½ - 40¾
Bald. Loco., com.	72½ - 85	Pipe, com.	14¾ - 15½
Bald. Loco., pref.	102¾ - 105½	Pipe, pref.	35 - 36
Beth. Steel, com.	196 - 250	U. S. Steel, com.	62¾ - 65½
Beth. Steel, pref.	121 - 139	U. S. Steel, pref.	110¾ - 111½
Colo. Fuel	33½ - 37	Va. I. C. & Coke	44
Gen. Elec.	165½ - 175¾	West'gh's Elec.	101¾ - 110
Gt. No. Ore Cert.	36¾ - 38¼	Chic. Pneu. Tool.	55 - 69
Int. Harv. of N. J., com.	96	Cambria Steel	50½ - 52½
Int. Harv. Corp., com.	62	Lake Sup. Corp.	8¼ - 9¼
Lackawanna Stl.	47 - 50	Pa. Steel, pref.	68 - 90
Nat. En. & Stm., com.	19¼ - 27¾	Warwick	8¼ - 9¼
Nat. En. & Stm., pref.	86 - 90	Cruc. Steel, com.	43 - 51
Pitts. Steel, pref.	84 - 85	Cruc. Steel, pref.	96½ - 100
Pressed Stl., com.	48 - 51	Harb-Walk. Refrac., com.	46½ - 48
		La Belle Iron, com.	35 - 35½

## Dividends

The American Brass Company, regular quarterly,  $1\frac{1}{2}$  per cent, and extra 1 per cent, both payable Aug. 2.

The Cambria Steel Company, regular quarterly,  $1\frac{1}{4}$  per cent, payable in cash Aug. 14. The three previous quarterly dividends declared by this company were payable in scrip, bearing interest at 5 per cent per annum, and redeemable in two years from their date.

The Dominion Bridge Company, regular quarterly,  $1\frac{1}{4}$  per cent, payable Aug. 16.

The International Harvester Company of New Jersey, regular quarterly,  $1\frac{1}{4}$  per cent on the preferred stock, payable Sept. 1.

The International Harvester Corporation, regular quarterly,  $1\frac{1}{4}$  per cent, on the preferred stock, payable Sept. 1.

The Pullman Company, regular quarterly, 2 per cent, payable Aug. 16.

The Taylor-Wharton Iron & Steel Company, regular quarterly,  $1\frac{1}{4}$  per cent on the preferred stock, payable Aug. 1.

The United States Steel Corporation, regular quarterly,  $1\frac{1}{4}$  per cent on the preferred stock, payable Aug. 30.

The Inland Steel Company, 2 per cent, payable Sept. 1. The last three quarterly dividends of this company have been at the rate of 1 per cent, and previous to that had been  $1\frac{1}{4}$  per cent.

## PERSONAL

Effective Aug. 1, some changes among executive officials and in the sales department of the Republic Iron & Steel Company at Youngstown will go into effect. In order to relieve H. L. Rownd, now vice-president and treasurer, of some of his duties, Herman Hurd, who has been assistant treasurer, has been elected treasurer. This will allow Mr. Rownd to give some of his time to the sales department. W. B. Topping, who has been in charge of the Cleveland sales office, has been made assistant sales manager, succeeding G. F. Alderdice, who has resigned to become assistant to President W. A. Thomas, of the Brier Hill Steel Company, at Youngstown. W. E. Collier, who has been in charge of the Birmingham, Ala., sales office, will succeed Mr. Topping at Cleveland. A successor to Mr. Collier at Birmingham has not yet been named. C. T. Johnston, who has been general sales manager of the Republic Company for some years, with headquarters at Youngstown, will continue in that capacity.

H. F. Gordon, manager of the advertising department of the Wheeling Corrugating Company and identified interests at Wheeling, W. Va., has resigned to become advertising manager of the Newport Rolling Mill Company, Newport, Ky.

C. L. Altemus has been appointed manager of the New York office at 165 Broadway of the American Steel Export Company, succeeding H. Gossen. Mr. Altemus has been connected for about ten years with the Cambria Steel Company, first at Philadelphia and then at the Detroit and Johnstown sales offices, and has had a two years' experience in the open-hearth department of the Cambria works and later was associated with E. F. Kenney in metallurgical researches for the company.

W. C. Collins severed his connection with the Keystone Steel & Wire Company, Peoria, Ill., July 1, to become vice-president and manager of sales of the Pekin Wagon Company, Pekin, Ill. In his new position he will serve many members of the same trade with which he has been closely related in the past nine years.

The death of D. B. McClelland, vice-president and treasurer, Spang, Chalfant & Co., Inc., Pittsburgh, has made some changes among officials of this company necessary. George Matheson, Jr., has been made vice-president and will continue also as general man-

ager. A. M. Bell, secretary, has been made treasurer and will fill the duties of both offices. R. D. Morris, formerly manager of sales in the Pittsburgh district, has been made general manager of sales. Boyd Watson has been made manager of sales for the Pittsburgh district.

Albert J. Ott, formerly with the Landis Tool Company, is now Western representative for the Model Tool Company, Erie, Pa., maker of self-contained grinding machines and precision tools, with offices 32 North Clinton Street, Chicago.

J. A. Durfee has been appointed by the Jones Laughlin Steel Company, Pittsburgh, to the position of metallurgical engineer.

The Michigan Bolt & Nut Works, Detroit, Mich., announce with great regret the resignation of Hector MacLean as secretary and treasurer of the company because of ill health. He is succeeded as secretary by R. H. Hill, for seventeen years with the Upson Company, Cleveland, Ohio, and as treasurer by F. S. Bigler. The executive officers from July 1 are as follows: President, Levi L. Barbour; vice-president, treasurer and general manager, F. S. Bigler; secretary, R. H. Hill.

P. R. Foley, for a number of years sales agent in the Philadelphia territory for the Eastern Steel Company, Pottsville, Pa., has succeeded Lorenzo C. Dilks as general sales manager and will have his headquarters in Philadelphia. Frank W. Jones, who has been assistant sales agent in the Philadelphia district, succeeds Mr. Foley as sales agent.

Col. George Pope, president of the National Association of Manufacturers, and James A. Emery, general counsel, are about to make a tour of the Pacific Coast, addressing manufacturers in the interest of the organization. They are to be in Spokane Aug. 1 and later go to Seattle and Portland.

W. A. Sproull, who recently resigned his position as traffic manager of the Cambria Steel Company, Johnstown, Pa., to become manager of the transportation bureau of the Chamber of Commerce of Philadelphia, was presented with a pair of solid silver service trays by a number of his railroad friends in Pittsburgh.

H. J. McCauley, Buffalo, N. Y., has bought the interest in the Forsyth Metal Goods Company, Buffalo, manufacturer of household and hardware specialties, metal stampings, etc., held by H. B. Rose, who has been president and treasurer.

The Commercial Club of Superior, Wis., has invited Judge Elbert H. Gary, chairman of the United States Steel Corporation, and Governor Emmanuel Philipp of Wisconsin, to be the principal speakers and guests of honor at the celebration to be held in Superior Nov. 1 of the formal opening of the new plant of the Minnesota Steel Company, located between that city and Duluth, Minn. Civic bodies are organizing an industrial pageant to emphasize the commercial importance of the new plant to the industrial future of the Northwest.

Joseph Carson, London, England, representative of the Allis-Chalmers Mfg. Company, Milwaukee, Wis., spent several days at the works last week. Much important business had developed for his company in Europe, necessitating a personal visit to the general offices.

William H. Wendel, assistant manager of sales, Newport Rolling Mill Company, Newport, Ky., is taking a vacation, visiting Canadian points of interest.

A party which spent July 22 and 23 inspecting the entire plant of the Maryland Steel Company, Sparrows Point, Md., comprised A. E. Maccoun, J. A. Mohr, George W. Vreeland, M. R. Stevenson, William Stewart, T. F. Kinsel, J. B. Norris and T. J. Davis of the Carnegie Steel Company, and A. J. Boynton and J. C. Barrett of the National Tube Company.

The Bradley Pulverizer Company, 90 State Street, Boston, manufacturer of pulverizing machinery, will move its manufacturing operations and its executive offices on Aug. 1 to a new plant recently completed at Allentown, Pa.

## OBITUARY

### Dilworth B. McClelland

Dilworth B. McClelland, for many years actively identified with the steel interests of Pittsburgh, died suddenly at his home in that city July 21, of heart failure, aged fifty-six years. While he had not been in robust health for a long time, his sudden death was a shock to his many friends. Mr. McClelland was vice-president, treasurer and a director of Spang, Chalfant



DILWORTH B. M'CLELLAND

Co., Inc., owner of the Etna Iron & Tube Works, Pittsburgh, and one of the oldest concerns in the Pittsburgh district making iron and steel pipe. He also had similar offices in the Fayette Coal Company and the Spang Land Company, identified interests of Spang, Chalfant & Co., and was active in other enterprises. Mr. McClelland was a native of Pittsburgh, and started his business career in a minor capacity with Thomas C. Jenkins, a wholesale grocer of that city. Later he was connected with the National Tube Company, and was for some time in its foreign sales department. He severed that connection to go with the Crane Company, Chicago, and then went with Spang, Chalfant & Co., about eleven years ago. He was a member of the Duquesne Club, the Union Club, the Pittsburgh Athletic Association, the Oakmont Country Club, the Press Club, the Hardware Club of New York and the New York Athletic Club. He leaves a widow and a daughter.

JORDAN LAWRENCE MOTT president J. L. Mott Iron Works of New York City and Trenton, N. J., died July 26 at his home in New York City, aged eighty-six years. He was born in this city, and received his early education at Irving Institution in Tarrytown, N. Y. Later he attended the University of the City of New York, but left during his junior year at the age of twenty to join his father in business. His father was Jordan L. Mott, the first of the name, and who founded the iron works that grew into the present company. Mott Haven, on the Harlem River, received its name from the iron works he established there. After joining his father Mr. Mott served an apprenticeship of four years, and was admitted into the business in 1853, when the J. L. Mott Iron Works was incorporated. In 1866 he took entire charge of the business. Ten years ago he removed the works from Mott Haven to Trenton, N. J., but retired from active management of the

business. He was interested in many other commercial enterprises and was also an enthusiastic yachtsman, having owned some of the fastest vessels on the list of the New York Yacht Club. He was a member of the New York and Engineers' clubs.

HENRY BORN, manager and treasurer of the Born Steel Range Company, Cleveland, Ohio, died July 21, aged seventy years. He had been the active head of the company since he founded it about twenty years ago. He leaves two sons, one of whom, Henry G. Born, is vice-president of the company.

JOHN HAVRON, at one time assistant manager of the Rogers Locomotive Works, Paterson, N. J., then sales manager of the Latrobe Steel Company, Latrobe, Pa., and later with the Walker & Bennett Mfg. Company, car seats, College Point, N. Y., died July 25 in Jersey City, N. J.

GEORGE WILLIAM SMITH, Frederick, Md., for many years head of the Maryland Hedge & Wire Fence Company, died July 22, aged eighty-three years. He was the builder and first president of the Frederick & Midletown Electric Railway Company.

### Republic Improvements at Youngstown

As briefly noted in last week's issue of THE IRON AGE, the Republic Iron & Steel Company will make extensive additions to its plants at Youngstown, Ohio. The present open-hearth steel plant contains ten 80-ton furnaces, and to these will be added two more of the same capacity, which will then give a total daily capacity of close to 2000 tons of open-hearth steel. A new lap weld furnace is to be added, to make pipe from 4 to 8 in. in size, and a butt weld furnace, to make pipe from 1/4 to 2 in. in size. The present tube mills contain two lap weld and two butt weld furnaces, and the two new furnaces will increase the capacity of the tube mill 50 per cent, but the range in sizes will remain as now, being from 1/4 to 12 in. in diameter.

A contract has been placed for the installation of Taylor mechanical stokers under the boilers at the Brown-Bonnell works, and a 2400-kw. alternating current generator will be installed at the Haselton works, the contract for which has not yet been placed. A contract has been given to the Raymond Concrete Pile Company, Youngstown, for the foundations for the open-hearth furnaces, and the McClintic-Marshall Company, Pittsburgh, has been given an order for the steel, about 500 tons, to cover the addition to the open-hearth building to accommodate the two new furnaces.

The Republic Company now has 66 Koppers by-product coke ovens and is building 75 more of the same type. These 141 Koppers ovens will make enough coke for all its blast furnaces at Youngstown, and also for the Hall furnace at Sharon and Atlantic furnace at New Castle, Pa. The benzol plant now turns out about 2600 gal. per day and this will be doubled. A new department for making conduit will also be installed, plans for which are now being made. It is expected to have all these additions completed and ready for operation in the latter part of this year.

William Burnside, Bellefonte, Pa., has purchased at trustees' sale the plant of the Cherry Tree Iron Works at Cherry Tree, Indiana County, Pa., for a consideration of \$12,000. The plant has been working regularly the past year under the direction of trustees for the bondholders. It specializes in the building of mine cars and also does a general foundry business. Mr. Burnside intends to continue this class of work and to increase the capacity of the plant. His brother, Edgar Burnside, will probably be made the manager.

The strike of employees of the Wright Wire Company at its Palmer, Mass., plant has interfered little with the output of finished wire products at the Worcester plant. The Palmer mill is largely a raw material plant from which wire is shipped to Worcester for manufacturing.



## Large French Orders for Bars and Heavy Shell Requirements

Large additional orders for steel bars have been placed in the past week by the Cleveland firm which has been buying in this country for France. The previous orders were about 125,000 tons and those just given out bring the total up to close to 350,000 tons. Included in the latest contracts are 20,000 tons of 82 mm. diameter, 4000 tons of 90 mm., 40,000 tons of 96 mm., 8000 tons of 125 mm., 22,000 tons of 140 mm., 30,000 tons of 180 mm., 40,000 tons of 90, 92 and 100 mm., 20,000 tons of 125 to 140 mm., and 35,000 tons of 160 to 180 mm. An additional 100,000 tons will be contracted for at acceptable prices and deliveries. Among further purchases which will be made are quantities of shell forgings, the requirements for France for which the forgings may be placed in this country amounting to 6000 shells a day over the next six months, the range of sizes being from 6-in. to 11-in. shells. The 6-in. shell weighs about 150 lb. and a shell of 12½ in. diameter weighs 1000 lb. A 16½-in. shell, which is included in recent lists of French munitions, weighs close to a ton.

## Pittsburgh and Nearby Districts

The Pittsburgh Piping & Equipment Company, Pittsburgh, has received a contract for all the piping equipment for the new River blast furnace and also for the open-hearth steel works of Corrigan, McKinney & Co., Cleveland, Ohio. This is one of the largest contracts for steel piping equipment placed for some time.

The William B. Pollock Company, Youngstown, Ohio, builder of heavy steel plate work, recently shipped several additional ladles for metal cars to the Broken Hill Proprietary Company, New Castle, Australia.

At Pittsburgh, July 21, bids were opened by the county commissioners for the furnishing of 5600 tons of structural steel for new city and county buildings. The bids were as follows: American Bridge Company, \$204,402, and additional material required, 1.9c. per lb.; Jones & Laughlin Steel Company, \$193,965, and additional, 1.75c. per lb.; Fort Pitt Bridge Works, \$203,900, and additional, 2c. per lb.; McClintic-Marshall Company, \$206,612, and additional, 1.88c. per lb.; Riter-Conley Mfg. Company, \$199,937, and additional, 1.91c. per lb.

The American Zinc & Chemical Company, with works at Langeloth, Pa., has opened an office at 1420 Oliver Building, Pittsburgh.

The National Forge & Tool Company, Erie, Pa., has been incorporated with a capital of \$50,000. Frederick J. McCoy, Erie, Pa., is treasurer.

The Matoaka Packing Company, Bluefield, W. Va., has been incorporated by W. C. Huffman and others to erect a cold storage plant.

The Thomas Coupling Company will move its offices and plant after Sept. 1 from Warren, Pa., to Troy, Pa., where it is now erecting a new shop, which is to have an equipment of new tools. Heretofore the company has been specializing on shaft couplings, but in the new quarters it is to take up power transmission appliances in general.

The Mesta Machine Company, Pittsburgh, is now building a complete line of hydraulic and steam-hydraulic presses for piercing, drawing and forging. At present fifteen such presses are going through its plant. It is also making accumulators of various sizes for use in connection with hydraulic systems. Among the accumulators now being built is one exceptionally large in size and capacity. It is 32 in. in diameter with a 25-ft. stroke, and will deliver water at a pressure of 2500 lb. per square inch. The plant is well equipped for doing this work and is in position to make quick deliveries.

The Franklin Steel Works, Franklin, Pa., have booked orders for 600 tons of rerolled reinforcing bars for a building for the Goodrich Rubber Company, and

350 tons for a building for the Firestone Rubber Company, Akron, Ohio.

John M. Jamison, president Jamison Coal & Coke Company, Oliver Building, Pittsburgh, has sailed for France to make arrangements for the shipment of coal and coke to European ports. Large inquiries are in this country from France, England and Italy for coal and coke. One Pittsburgh coal interest has been shipping considerable quantities of steam coal to Italy for some time.

A. M. Byers & Co., Inc., Pittsburgh, manufacturers of iron pipe and operating Mattie furnace, two puddling plants and plate mills at Girard, Ohio, has increased its capital stock from \$1,500,000 to \$2,000,000.

The Pittsburgh office of the Shaw Electric Crane Company, Robert A. Bole, manager, has received an order for two 5-ton, seven 15-ton and one 20-ton electric traveling cranes to be installed in the buildings to contain the 20 new hot tin mills to be erected by the McKeesport Tin Plate Company, McKeesport, Pa.

It is the intention of the National Tube Company to double the capacity of the seamless steel tube works at Ellwood City, Pa., operated by the Shelby Steel Tube Company, an identified interest. This plant now has an annual capacity of about 60,000 tons of seamless steel tubing, ranging from ½ to 8 in. in diameter. All that has been authorized so far in the additions to be made is a new steel building, 240 x 600 ft., foundations for which are now being prepared. The building will be erected by the American Bridge Company and will require about 2500 tons of steel.

The Koppers by-products coke plant to be erected by the United Furnace Company, Canton, Ohio, an identified interest of Pickands, Mather & Co., Cleveland, and the United Steel Company, Canton, will contain fifty by-product coke ovens instead of forty-seven.

The Standard Bridge Tool Company, Fulton Building, Pittsburgh, has received an order from Lewis P. Shoemaker & Co., Pottstown, Pa., for an automatic spacing table for heavy bridge work, which is designed to punch plates up to 8 ft. wide, also two 8 x 8-in. angles, up to 90 ft. in length. The company also has contracts for a quick-acting table of new design for installation in the plants of the Greenville Steel Cast Company, Greenville, Pa., the Case Crane & Engineering Company, Columbus, Ohio, and the Bettendorf Company, Bettendorf, Iowa.

The Struthers Wells Company, Warren, Pa., has laid foundations and started erection work on a new steel, concrete and brick building, 200 x 200 ft., in the shape of four bays, each 200 ft. long, and each to be served by a crane. The building will be used as a flanging and light plate shop.

The Wilmarth Tool Works and the Cleveland Machine Tool Works, Cleveland, Ohio, have effected a combination. The manufacture of the Wilmarth drills will be conducted at the plant of the Cleveland Machine Tool Works, under which name the combined business will be continued. To provide additional factory space to meet the requirements of the combined interests, an extension is being erected to the plant of the Cleveland Machine Tool Works which will practically double its floor capacity. The plant has recently taken a good volume of foreign orders and has also booked an order for five boring mills for use on warships in the United States Navy.

The American Brass Company, Kenosha, Wis., has completed the erection of a new shop addition in record time. In 30 days after the contract for a brass foundry was awarded to the American Bridge Company the building was turned over to the company. P. B. Johnson, Milwaukee, was erecting engineer, and William J. Wolf, also of Milwaukee, acted as building superintendent. The structure is of steel and sheet iron, 60 x 330 ft., and 27 ft. high.

The Hydraulic Press Mfg. Company, Mount Gilead, Ohio, is exhibiting forcing and bending presses and equipment in the Palace of Machinery at the Panama-Pacific International Exposition. The name of the company was incorrectly stated in our issue of July 15, in a brief description of the exhibit.

# Machinery Markets and News of the Works

## IMPROVEMENT IS GENERAL

### Better Business Reported Everywhere

New England a Bee-Hive of Industry—The Morrow Mfg. Company Buys Heavily—Corrigan, McKinney & Co. Issue a List

Developments in the metal-working industries take place now with startling rapidity. Plants, equipment and financial control are all being readjusted to align with the extraordinary demands that have been placed upon them. The details of war contracts continue to come to light, but the general improvement now reported simultaneously from all parts of the country exceeds these more spectacular features in importance. Both domestic and foreign demand contribute to it, and cannot be separated.

The summary of the additions to munitions factories sounds almost fanciful. The New England Testinghouse Company, Springfield, Mass., will add four buildings to its Stevens-Duryea plant to cost \$250,000. The New England Mfg. Company, Woburn, Mass., is building nine structures for the manufacture of explosives to cost \$100,000. The United States Cartridge Company, Lawrence, Mass., has bought a four-story mill nearby for a cartridge shop. The International Arms & Fuse Company, Bloomfield, N. J., will erect a factory to cost \$100,000. The Eddystone Munitions Company, it is reported, will build a plant to cost \$1,500,000, and the Remington Arms & Ammunition Company is adding three buildings to its Eddystone plant. The Timken-Detroit Axle Company is doubling its Detroit factories. The Willys-Overland Company, Toledo, is erecting a five-story structure 400 ft. square.

The surprising news of war contracts is added to from day to day. The Bartlett-Hayward Company, Baltimore, Md., has a contract from J. P. Morgan & Co. that calls for 8000 shells a day. The Hendee Mfg. Company, Springfield, Mass., will manufacture 1000 motorcycles for England, which is negotiating for 15,000 more, to cost about \$3,000,000. The Knox Auto Company, Springfield, Mass., has received an order for heavy motor trucks for France. The order for 6-in. shells recently given the W. J. Oliver Mfg. Company, Knoxville, Tenn., will total about \$9,000,000.

Heavy purchases of tools were made by the American Locomotive Company, the New Departure Mfg. Company, Bristol, Conn., the Chase Motor Truck Company, Syracuse, N. Y., and the Morrow Mfg. Company, Elmira, N. Y., which bought \$300,000 worth of machines. Other buyers were also prominent. In Cleveland sales of 685 lathes were reported last week, 450 for shipment to England and others to Canada. Negotiations with purchasing agents of the Allies occupied a place of first importance in Chicago. J. P. Morgan & Co. are still buying tools for both France and England.

The imperative demand for lathes has caused the American Wood Working Machinery Company, Roch-

ester, N. Y., the J. A. Fay & Egan Company, Cincinnati, and the Morton Mfg. Company, Muskegon, Mich., to take up their production. The Cisco Machine Tool Company, Cincinnati, has purchased the Von Wyck Machine Tool Company and will increase its capacity.

Corrigan, McKinney & Co., Cleveland, have issued a list of forty-two machine tools for the shops of their new steel plant. It calls for nine lathes, nine grinding machines, four drill presses, four saws, three shaping machines, two radial drilling machines, two planing machines, and various cutting, punching, slotting and bending machines.

## New York

NEW YORK, July 28, 1915.

Despite far off deliveries the buying of machine tools is greater than ever. Dealers who handle varied lines of tools are booking orders whose size is really startling, when past records are considered. Several manufacturers have increased their output by adding to their facilities, and now are able to make deliveries to a limited extent within this year. Others have increased their equipment, but still cannot promise machines before the spring months. Production is being extended in an interesting manner, as, for instance, in the case of the American Wood Working Machinery Company, Rochester, N. Y., which is making lathes after the patterns of a lathe builder in that city. Similar work is being done by the J. A. Fay & Egan Company, Cincinnati, Ohio. Dealers have no difficulty in disposing of these machines. The Salem Iron Works, makers of wood-working and special machinery is interested in the conversion of ordinary engine lathes into shrapnel-making machines. Some tool builders are reported to be modifying their machines to fit them for shell work and are obtaining better prices than can be obtained for standard machines.

The number of concerns who are buying for the fulfillment of war orders is undiminished. Inquiries have come from silversmiths and makers of dental instruments, who have taken or are considering orders for some portion of shell work. The American Locomotive Company continues a large buyer. The contract of the Bartlett-Hayward Company, Baltimore, Md., calls for a production of 8000 shells per day, and much machinery has been purchased. The interests controlling the American Machine & Foundry Company, which has a contract for fuse timers and has purchased about 200 automatic machines, has organized a company known as the Automatic Machine Products Company.

The New Departure Mfg. Company, Bristol, Conn., has placed a large order for machine tools for its ball bearing department, the capacity of which it is increasing. The Morrow Mfg. Company, Elmira, N. Y., has placed orders for about \$300,000 worth of machinery for its ball-bearing, and other departments. The Chase Motor Truck Company, Syracuse, N. Y., also has been a notable purchaser. J. P. Morgan & Co. is purchasing for France, as well as England, and has placed orders for miscellaneous equipment, including bar cutting-off machines, a crane, etc. Other buyers have been the Newport News Ship & Dry Dock Company, and the Lake Torpedo Company. The latter company bought a double-end punch and shear, plate planer and set of bending rolls.

Stone & Webster, engineers, New York, state they have not inquired for 100 turret lathes, as was reported in THE IRON AGE of July 15. Who made the inquiry, using their name, is not known.

The Aetna Explosives Company, 2 Rector Street, New York City, is now finishing the erection of its powder plant at Emporium, Pa., containing some thirty buildings, and is now operating at an approximate capacity of 100,000 lb. of explosives per day.

The Sun Motor Car Company, Buffalo, recently incorporated with a capital stock of \$750,000, has purchased the plant of the Janes Silk Company, South Park Boulevard and the Buffalo, Rochester & Pittsburgh Railroad, and will com-

mence manufacturing operations as soon as equipment is installed. It has let contract for an additional building, 150 x 600 ft., of reinforced concrete, to be erected and equipped at once. Other buildings will be erected later on a four-acre site acquired adjoining the plant. The directors are Roscoe C. Hoffman, J. P. Black, Charles H. Burras, R. Crawford, Walter W. Chamberlain and Hiram R. Hankin, a number of whom were formerly connected with the Haynes Motor Car Company, Kokomo, Ind.

The General Electric Company, Schenectady, has inquiries out for about fifteen lathes and other machine tool equipment.

The John S. Tilley Ladders Company, Watervliet, N. Y., suffered a total loss of its factory by fire July 19 with a reported loss of about \$90,000. It is arranging temporary manufacturing quarters for which machinery is now en route, and plans to start operations about Aug. 2. It will rebuild its factory, to be completed before next winter.

Arthur Seligman, 165 Broadway, New York, importer and exporter of metals and ores, is in the market for rivet-making machinery.

Plans have been filed at Bloomfield, N. J., by the International Arms & Fuse Company for the construction of a one-story iron and steel factory building, 184 x 525 ft., to be erected on Grove Street, along the Orange branch of the Erie Railroad. Francisco & Jacobus, 200 Fifth Avenue, New York City, the engineers, have estimated the cost at \$100,000.

The American Radiator Company, 816 South Michigan Avenue, Chicago, Ill., is constructing a new foundry building at its plant at Buffalo, N. Y., approximately 220 x 250 ft. It will be used in connection with the manufacture of patterns, machinery and supplies which are made by this plant for the company's other establishments, both here and abroad.

The Perkins Foundry Company, Amsterdam, N. Y., recently incorporated, has taken over an existing plant where it will do a jobbing, foundry and machine shop business. William E. Walker is president and treasurer; George H. North, vice-president and general manager, and John S. Walker, secretary.

The J. B. Wise Ammunition Corporation, Watertown, N. Y., has been incorporated with a capitalization of \$100,000 to manufacture ammunition, etc. J. B. Wise, E. W. Wise and L. C. Mitchell, Watertown, are the directors.

The W. H. Schleit Mfg. Company, Eastwood, N. Y., has been incorporated to manufacture stoves, heating devices, special hardware, etc. C. E. Kashore, K. G. and Romeyn Warmuth, 713 Cortland Avenue, Syracuse, are the directors. The capital stock is \$200,000.

The Buffalo Bolt Company, Tonawanda, N. Y., has completed plans for an addition to its plant requiring 300 tons of structural steel. It has increased its capital stock from \$500,000 to \$1,000,000.

The United Welding & Mfg. Company, Queens Borough, New York City, has been incorporated by E. S. Foster, C. Giacomorrow and J. Kohrman, 81 East 125th Street, New York City, to manufacture machinery and special apparatus.

The Gurney Ball Bearing Company, Jamestown, N. Y., has let general contract for the construction of its new plant to the Lackawanna Bridge Company, Buffalo.

The saw and planing mill of the R. J. Rogers Lumber Company, Geneva, N. Y., which was destroyed by fire July 11, is to be rebuilt promptly.

The Clark Brothers Company, Olean, N. Y., manufacturer of heavy sawmill machinery, is preparing to equip its plant for the manufacture of a large quantity of artillery ammunition for the British Government, for which it is completing negotiations.

The Imperial Color Works, Inc., Queensbury, N. Y., have been incorporated with a capital stock of \$150,000 to manufacture colors, paints, dyes, etc. G. Tait, J. J. McCabe and K. R. McBride, Glens Falls, N. Y., are the incorporators.

The plant of the Union Forging Works, Binghamton, N. Y., which was recently heavily damaged by fire, is to be rebuilt at once, of fire proof construction.

Under the name of Strong Motors, Inc., H. G. Strong, H. D. Shedd and G. E. Wyncoop, Rochester, have incorporated a company with a capital stock of \$25,000 to manufacture automobiles, motorcycles, etc., and will equip a factory.

Centreville, N. Y., has voted to issue bonds for the construction of a waterworks system to cost \$25,000. I. D. Wolf is president of the village board.

The La Fargeville Electric Light Company, La Fargeville, N. Y., has completed plans for the construction of electric light plants at Theresa and Orleans, N. Y.

## Philadelphia

PHILADELPHIA, Pa., July 26, 1915.

It is reported that the Baldwin Locomotive Works will incorporate a company to be known as the Eddystone Munitions Company to handle a large order for shells, recently received. The business will be handled independently, in a manner similar to that in which its order for rifles for Russia will be handled. It is said that a building to cost about \$1,500,000 will be erected, to be ready for operations about four months.

The Remington Arms & Ammunition Company, Eddystone, Pa., has started the construction of three additional buildings, making a total of six to be built by the company. Each building will be 400 x 750 ft., of concrete and steel. These buildings are an addition to the 20-acre rifle plant and the rifle stock manufactory, 80 x 600 ft., now being built.

The William Cramp & Sons Shop & Engine Building Company, Philadelphia, is planning the replacement of some of its old shops with new structures.

The Atlas Ball Company, Second Street and Glenwood Avenue, Philadelphia, Pa., and the Hess-Bright Mfg. Company, both manufacturers of balls, are working at full capacity, but state that their output is for domestic consumption. Some of the departments are working both day and night. The Atlas Company has purchased the property and buildings of the Phillips Pressed Steel Pulley Company, at Fourth Street and Glenwood Avenue, and will alter the buildings for occupation by October next.

The Carlson-Wenstrom Mfg. Company, manufacturer of machinery, Erie Avenue and Richmond Street, Philadelphia, is working on forgings and machine parts connected with war orders.

The Artillery Fuse Company, Wilmington, Del., has leased the plant of the Standard Arms Company in South Wilmington, and is engaged in the manufacture of time fuses for heavy shells. The City Council has granted permission for the storing of sufficient amounts of powder to enable the company to handle such a business. A large force of workmen is reported to have been working rapidly in renovating the plant for its new purpose. It was recently occupied by the Dupont Typewriter Development Company, which has vacated the property.

The Haverford Cycle Company, 527 Arch Street, Philadelphia, Pa., has awarded contract to the Phillip Hailach Contracting Company, Twenty-sixth and Thompson Streets, for the construction of a five-story brick and steel factory at 503 Market Street, 35 x 140 ft., to cost about \$30,000. Peuckert & Wunder, 310 Chestnut Street, are the architects.

The Baer Mfg. Company, 1402 North American Building, Philadelphia, has been incorporated to manufacture automobile accessories. B. A. Baer is general manager.

The business of Brownworth & Co., Real Estate Trust Building, Philadelphia, Pa., manufacturers of fire escapes and structural and ornamental ironworkers, has been purchased by C. J. Hogue, W. L. Betts, William Hall, W. A. G. P. and Lee S. Leiser, with a capital stock of \$10,000. The new owners will continue the business and Mr. Betts will continue as manager. W. A. Leifer, of W. A. Leifer & Co., will be treasurer. Lee S. Leifer is associated with James R. Wotherspoon, 238 North Front Street, Philadelphia, manufacturer of stoves and sheet metal specialties.

The Audubon Wire Cloth Company, Audubon, N. J., has been incorporated with a capital stock of \$50,000 by Robert T. Korb, and others, to manufacture wire cloth. Mr. Korb is president; Henry H. Collins, Bryn Mawr, Pa., vice-president; and William H. Egee, Audubon, secretary, treasurer and purchasing agent.

The Figueroa Cut Glass Company, Hammonton, N. J., will receive bids shortly for the construction of a 2½-story brick factory, 32 x 140 ft., to cost about \$10,000. While the new building is to take care of increased business, present equipment will probably be sufficient.

The Struthers Iron Works, Altoona, Pa., is razing its old boiler and forge shops and will replace them with modern steel, concrete and brick buildings.

E. T. Edwards, Columbia, Pa., is arranging to resume operations at his pipe mills.

Edward G. Budd Mfg. Company, Twenty-fifth Street and Hunting Park Avenue, Philadelphia, Pa., sheet metal worker, has quadrupled its factory space, working force and output since last December and is now rushed to capacity in the manufacture of automobile parts and bodies and railroad supplies. It states positively that it has no war business.

The Rowe Motor Mfg. Company, manufacturer of motor trucks, East Downingtown, Pa., is adding 10,000 sq. ft. of floor



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to its factory by the addition of a brick building, 70 x 10 ft.

Wm. Shimer, Sons & Co., Freemansburg, Pa., manufacturers of wood-working machinery, will start about Sept. 1 to rebuild its foundry which was recently destroyed by fire.

The Ajax-Griels Rubber Company, Trenton, N. J., is having plans prepared for the erection of an addition to its plant at Albany, N. Y. W. W. Slack & Son, Trenton, are the architects.

## Baltimore

BALTIMORE, MD., July 26, 1915.

War orders continue to hold attention in Baltimore. The latest is an order taken by the Bartlett-Hayward Company, 1001 and McHenry Streets. Announcement has been made by Howard Bruce, vice-president, that the company has secured a contract from J. P. Morgan & Co., after negotiating for sixty days. He says there has been no change in the ownership of the company, but a special corporation may be formed to handle certain portions of the work. Robert Garrett & Sons, bankers, Baltimore, have become associated with the Bartlett-Hayward Company. Although the officials refuse to make a statement, it is generally believed that the company will in the near future begin work on large improvements. Property adjoining the present plant has been taken over and the occupants are to vacate by Aug. 1.

Baltimore is being considered as a location for a new plant for the Stergianopoulos Arms Company, Wilmington, Del. The company wants a large tract of land. The capital stock of the company has been increased from \$500,000 to \$1,000,000.

The Spedden Shipbuilding Company, Boston Street and Greenwood Avenue, Baltimore, is considering the manufacture of munitions of war. George A. Dean, Jr., is superintendent.

Acids used in the manufacture of gunpowder and other explosives are to be the product of a plant which will be built at Colgate Station, Md. The name of the new company is withheld, but all the property transactions have been carried on by Frensdorf & Brown, distillers, Colgate Station, Md. The buildings will cover about eight acres and will be of brick, concrete and steel construction. It is said some orders already have been received.

The United States Asphalt & Refining Company, East Brooklyn, Md., will enlarge its plant. Improvements to cost about \$200,000 are to be made and it is planned to increase the output 25 per cent. John Zink is manager.

The Shawinigan Electro Products Company, Highlandtown, Md., of which P. H. Falter, United States Fidelity & Guaranty Building, Baltimore, is manager, will spend about \$20,000 as the initial cost of its plant. The plans call for a main building, 55 x 70 ft., a coal dryer, unloading hopper, conveying machinery, electric overhead monorail system, electric furnaces, etc. The daily consumption of raw materials is to be 40 tons of silicon rock, 20 tons of coke and 10 tons of iron ore.

A contract for a three-story paper box factory, 76 x 98 ft., to be built at Holliday and Saratoga Streets, Baltimore, for the C. J. Youse Company, 23 and 25 South Gay Street, Baltimore, has been awarded Walter E. Burnham, Law Building, Baltimore.

The Enterprise Hardware & Mfg. Company, Frederick, Md., of which Harry L. Ebert is president, plans a plant for the manufacture of locks, hinges, etc.

Extensive improvements will be made at Hagerstown, Md., by the Cumberland Valley Railroad. T. B. Kennedy, Chambersburg, Pa., is the engineer in charge.

The Fractional Adding Machine Company, Richmond, Va., has been incorporated with a capital stock of \$25,000. The officers are: President, Joseph F. Leitner, Wilmington, N. C.; secretary-treasurer, John F. Rhodes, Newbern, N. C.

The Kline Motor Car Company, Richmond, Va., is reported to be planning to increase the capacity of its shop.

The plant of the Olney Dunbar Glass Company, Dunbar, N. Va., has been bought by the Pennsylvania Glass Company, Philadelphia, and machinery costing about \$30,000 will be installed.

George H. Wiggin, Townsend, Del., is said to be planning the construction of an electric plant.

The Virginia Lumber & Box Company, Petersburg, Va., manufacturer of shooks and lumber, whose box factory and equipment were destroyed by fire July 7, with a loss estimated at more than \$50,000, is rebuilding. The power plant was only slightly damaged and operations will probably be resumed about Aug. 1.

## New England

BOSTON, MASS., July 26, 1915.

The free passage and 50 cents an hour offered by English manufacturers to machinists, which induced a number of English and Scotch workmen to return there earlier in the year, does not seem to be very effective now, although the wage is considered approximately equal to the wage here of 60 cents an hour. It is probable that it will cease altogether with the shorter hours and better pay now being offered. While hours for workmen may be reduced, the factories are tending to lengthen the hours of operation. In Meriden, Conn., the Bradley & Hubbard Mfg. Company, brass goods manufacturer, is working 55 hr.; the Charles Parker Company, manufacturer of anvils, etc., 48 hr.; the Edward Miller Company, producer of castings, etc., 50 hr.; the Meriden Firearms Company, 55 hr.; Foster, Merriam & Co., maker of brackets, castings, etc., 55 hr.; the M. B. Schenk Company, manufacturer of casters, 50 to 55 hr.; and Jennings & Griffen, makers of carpenter's augers, etc., 55 hr. a week. The Carlyle-Johnson Machine Company, maker of friction clutches, reverse gears, etc., Manchester, Conn., is working until 9 p. m. three days a week to keep pace with its orders.

The New Britain Machine Company, New Britain, Conn., is working day and night on foreign orders for semi-automatic chucking machines, which it is understood are to be used to make munitions. The Hendee Mfg. Company, Springfield, Mass., has received an order for about 1000 motorcycles from England. Other European governments are said to be negotiating for about 15,000 cycles to cost \$3,000,000. The Knox Auto Company, Springfield, Mass., has received an order for motor trucks from the French Government to be equipped with artillery. Some of the vehicles will be fitted out as portable machine shops. H. F. Blanchard of the Knox Company, who went abroad some months ago as sales manager there, will make his headquarters in New York until Sept. 15 as the agent for one of the foreign governments for the purchase of all motor vehicles. The Portland Company, manufacturer of grate bars, Portland, Me., is negotiating for contracts for the manufacture of war munitions.

The Pratt & Whitney Company, Hartford, Conn., has been incorporated at Wilmington, Del., with a capital stock of \$25,000. Shipments from the plant are said to have totaled \$800,000 in June, and constitute the largest monthly business in the history of the company.

The idle plant of the Pope Mfg. Company at Westfield, Mass., has been sold to interests represented by Scott McLaughlin, 135 Broadway, New York, and Wilbur Walker, 30 Church Street, New York. The purchase price was \$725,000. The sale includes all the real estate, fifteen acres, the large factory buildings and equipment, the cash on hand with the receivers, amounting to about \$229,186, and the liabilities assumed by the receivers. It is understood that a new company will be formed with a capital stock of \$1,600,000.

Manning, Bowman & Co., Inc., maker of enameled ware, Meriden, Conn., has increased its capital stock from \$100,000 to \$600,000 to take care of its increased business. It has awarded contract for a building 43 x 200 ft., containing about 9000 sq. ft. of floor space. At a recent meeting George E. Savage, president of the company, was elected to the board of directors of the Vacuum Specialty Company, Meriden, in which the former company has acquired a controlling interest. The Vacuum Company's New York office will be discontinued.

The Simplex Air Craft Company, New Haven, Conn., has been incorporated with a capital stock of \$300,000 by Virginius J. Mayo, Stephenson MacGordon and Chance M. Vought of New Haven, to manufacture military biplanes. The initial capital will be \$60,000. Mr. Mayo is president of the Mayo Radiator Company, New Haven.

The Avis Company, Orange, Conn., has been incorporated with a capital stock of \$100,000 to manufacture firearms, ammunition, etc., by John R. Halstead, Samuel R. and George E. Avis of New Haven. It has leased the former Mathushek piano factory in West Haven for a long term of years. The initial capital stock will be \$2,000.

The Consolidated Equipment Company, Middletown, Conn., has been incorporated with a capital stock of \$100,000 by Earle H. Russell, treasurer of the Noiseless Typewriter Company, Henry C. Perry and Raymond F. Byrne. It will use a part of the plant of the Noiseless Typewriter Company's plant and will employ about 100 men in the manufacture of shrapnel shells. Operations will start in about ninety days. It is said that the company has been organized in the interest of the directors and stockholders of the Typewriter company.

The Electrical Engineering & Storage Battery Company, Sandy Hook, Conn., will take over the idle plant of the New York Belting & Packing Company at this place and manufacture electric motors and equipment.

The Whitney Mfg. Company, manufacturer of transmission chain, etc., has had plans drawn for a reinforced factory, 60 x 64 ft., four stories, to be erected on the west side of Bartholomew Avenue at a cost of \$25,000.

The Hartford Special Machine Company, at Woodland Street and Homestead Avenue, Hartford, Conn., will erect a one-story brick and concrete factory, 60 x 320 ft., to cost \$35,000.

The Athol Mfg. Company, Athol, Mass., has been incorporated with a capital stock of \$100,000 to manufacture imitation leather. It has purchased special machinery which it will install in the idle Gaynor mill. L. S. Starrett of the L. S. Starrett Company, manufacturer of tools, is president, and J. D. S. Everett, treasurer.

The New England Westinghouse Company, Springfield, Mass., will start the construction of four buildings to be added to the Stevens-Duryea plant in East Springfield, at an approximate cost of \$250,000. The company has acquired 35 acres of land, but no announcement has been made as to its development.

The Gilbert & Barker Mfg. Company, Springfield, Mass., manufacturer of heat-treating furnaces, is making additions to its office and experimenting departments, 40 x 80 ft., two stories, and is doubling the size of its machine shop by an extension 65 x 100 ft., two stories. It has lately been compelled to use a tent for part of its assembling department.

Wyman & Gordon, 30 Bradley Street, Worcester, Mass., will erect an additional forge shop, 40 x 80 ft., one story, of steel and frame construction, to cost about \$2,000. It will also add to its annealing shed.

The Morgan Spring Company, Worcester, Mass., has had plans drawn by Lockwood, Greene & Co., Boston, for an addition to its plant, 120 x 200 ft.

The New London Ship & Engine Company, Groton, Conn., has plans for another building in addition to those under construction. It is said that it will triple the capacity of the present plant.

The Morse Twist Drill & Machine Company, New Bedford, Mass., has sold some structures on land, it is said, the company will use for a new building for its plant.

The Stephens Nut & Bolt Company, Pawtucket, R. I., has purchased the factory of the Acme Leather Company, Pawtucket, and will equip it for the production of its own goods.

The Springfield Foundry Company, manufacturer of gray-iron castings, Springfield, Mass., has awarded contract for the reconstruction of its plant at Indian Orchard, recently damaged by fire.

The J. W. Bishop Company, 109 Foster Street, Worcester, Mass., has the contract for the erection of a boilerhouse addition to the Saunders Cotton Mills, Saundersville, Mass., to cost about \$4,800.

The Wright Wire Company, Worcester, Mass., will build a four-story office building, 40 x 208 ft., to cost about \$25,000.

The C. H. Cowdrey Machine Company, Fitchburg, Mass., which is making shells for the United States Government, and also bread-wrapping machinery under contract with a Nashua, N. H., company, is building an addition to its main shop.

It is reported that Lockwood, Greene & Co., Boston, are completing plans for an addition to machine shop of the Heald Machine Company, manufacturer of grinding machines, Worcester, Mass.

The Waltham Emery Wheel Company, Waltham, Mass., will erect an addition 75 ft. long to take care of its increased business.

The New England Mfg. Company is erecting a plant for the manufacture of explosives from benzol on the property leased from the Merrimac Chemical Company in North Woburn, Mass. Three buildings are now nearly completed. Eventually nine will be erected at a total cost of \$100,000. Thomas H. Shannon is superintendent.

The United States Cartridge Company, Lawrence, Mass., has purchased one of the mills of the United States Bunting Company adjoining its plant and will convert it into a cartridge shop. The building is 60 x 150 ft., four stories, of brick construction. It has been unofficially stated that the company will start the erection of another plant near-by. About 3500 men are now employed and the number will probably soon be over 4000.

The Massachusetts Forging Company has been incorporated at Portland, Me., with a capital stock of \$25,000 to carry on a general metal forging business. Roland H. Boutwell, Exeter, N. H., is president.

## Chicago

CHICAGO, ILL., July 26, 1911.

Negotiations with purchasing representatives of the Allies now in Canada have been occupying the place of first importance in the machinery trade. While all other business has been made secondary to this and other war business more particularly by the tool builders, recent improvements in domestic demand, although modest as yet, has focused the attention of the machinery dealers upon the necessity of caring for their regular trade. A united effort is being made to secure special consideration with respect to deliveries from builders. With the entrance into the lathe building field of additional manufacturers, among whom are builders at Cincinnati, Ohio; Rockford, Ill., and Muskegon, Mich., whose policy will be, in part at least, the catering to domestic buyers unable to satisfy their requirements through usual channels because of delayed deliveries, the matter assumes added importance. Buying of plants from which to supply the demand for second-hand equipment continues to be a feature of local activity, and the past week has seen the closing of some large transactions. New wage scales adopted within the past ten days by machine tool builders, while forestalling the possibility of labor disagreements, may be felt in the form of higher prices.

The E. L. Essley Machinery Company, Chicago, has purchased the entire machine-tool equipment in the plant of the now defunct Wisconsin Engine Company, Corliss, Wis. It was suitable for the building of the heaviest engines and includes a 10-ft. planing machine, ten 16-ft. boring mills, 30-ft. pit lathe, an 8-in. horizontal bar boring machine and a Niles Corliss cylinder boring machine. With these, many other smaller tools will be marketed.

The Modern Tool & Stamping Company, Chicago, has been formed by Bernard J. Merkle, Abram Kerff and Elmer D. Brothers, 39 S. LaSalle Street. It has a capital of \$10,000.

The Northwestern Metal Spinning Mfg. Company, 130 West Division Street, Chicago, is in the market for metal spinning lathes and other metal-working equipment.

The Aurora Steel Tank Company, 33 West Illinois Street, Chicago, is inquiring for a used stake riveter with 12-in. throat and a metal-spinning lathe.

The Jacob Haish Company, DeKalb, Ill., wire manufacturer, is making improvements at its plant and has in contemplation further extensions to its capacity.

The Van Sicklen Auto Meter Company, Aurora, Ill., has negotiated a five-year arrangement with the Elgin National Watch Company, whereby its product will be manufactured in the latter's plant, the watch company taking over the machinery, dies and fixtures which have been used at Aurora. About \$75,000 will be expended for machinery, fixtures and tools to bring the production of speedometers up to 100 per day.

The Streater Clay Mfg. Company, Streater, Ill., will build a brick plant for completion by Jan. 1. Gas-fueled kilns and electrically-driven machinery will be installed.

The Brokaw-Eden Mfg. Company, Chicago, manufacturer of power washing machines, will move its plant to Alton, Ill., where it hopes to be operating by Oct. 1.

The Illinois Window Glass Company, Danville, Ill., has been incorporated with a capital stock of \$25,000 by Frank Masson, Leon Quinet, Sr., and August Gouthier.

The Sanitaire Products Corporation, Rockford, Ill., has been incorporated with a capital stock of \$30,000 by Walter and Milton H. Trigg, Edwin J. Thompson and E. F. S. Lane.

A part of the plant of the Willard Range Company, O'Fallon, Ill., has been burned with a loss of about \$10,000.

The Franklin Barn Equipment Company, Monticello, Iowa, has been incorporated with a capital stock of \$100,000 to manufacture barn specialties. It will start business about Aug. 15. George Tremper is president; R. W. Franklin, vice-president; A. J. H. McNeill, treasurer, and G. R. Stubbs, secretary.

E. A. Hornbostel and John W. Cary, 411 Harrison Avenue, Des Moines, Iowa, will incorporate a company with a capital stock of \$100,000 to manufacture a patented oil and water burner for domestic use.

The River Smelting & Refining Company, Keokuk, Iowa, has been incorporated at Portland, Me., with a capital stock of \$300,000 by Albert F. Jones, A. B. Farnham, J. P. O'Donnell, J. R. Griffen and George S. Soule. It has awarded contract to the Stone & Webster Engineering Corporation, Boston, Mass., for the construction of a large smelter for the refining of metals. R. G. Hall is the general manager.

The J. G. Cherry Company, Cedar Rapids, Iowa, manufacturer of creamery machinery and plants, will spend about \$125,000 on its plant at Tama, not \$75,000, as has been stated.

## Cleveland

CLEVELAND, OHIO, July 26, 1915.

The demand for lathes for making shells up to 4½ in. in diameter continues very heavy. A Cleveland dealer reports sale during the week of 685 lathes, 450 of which are to England and some of the remainder to Canada. The rest of these are single purpose machines, although some of the lathes were included in these orders. The British lathes were reported to be in the market for a large number of lathes for increasing the capacity of its arsenals. Among new inquiries is one from Corrigan, McKinney & Co., Cleveland, for a round lot of machine tools for a machine shop in connection with their new steel plant. The demand for hydraulic presses for shell work is heavy. The Akron industry brought out orders for five 52-in. boring mills this week, and several boring mills were sold for export to England. The demand for shapers has become fairly active. Orders of portable electric and pneumatic drills and other tools are getting a very good volume of business. Machine-tool business continues to come from the automobile industry. Metal-shop equipment is in good call, due to numerous plant extensions throughout the country.

Corrigan, McKinney & Co., Cleveland, has issued the following list of machine tool requirements for the machine shop, carpenter, boiler, forge, pipe, roll and electrical repair shops of its new steel plant:

- One 100-ton hydraulic press
- One bolt-cutting machine, ¼ to 3 in. inclusive, with dies, cutting taps and stay bolt dies
- One 60-in. geared head standard lathe
- One 36-in. x 24-ft. 6-in. triple geared engine lathe
- One 25-in. x 12-ft. double back geared engine lathe
- One 20-in. x 13-ft. 6-in. double back geared engine lathe
- One 14-in. x 10-ft. 6-in. double back geared engine lathe
- One 24-in. slotting machine
- One 72-in. rapid transverse turning and boring machine
- One 6-ft. semi-universal radial drill
- One 20-in. drill press
- One 14-in. sensitive drill press
- One 48-in. x 48-in. x 18-ft. planing-machine, with two ends
- One 24-in. crank shaping machine
- One 16-in. crank shaping machine
- Three 24-in. x 3-in. grinding machines
- Two new improved wet tool grinding machines, with 20 x 12-in. wheels, all to be equipped with safety collars or catches
- One drill grinding machine
- One No. 5 hack-saw
- One 20-in. double-stock 10-ft. bed wood lathe with attachment
- One 24-in. jointing machine
- One 36-in. wood band-saw
- One combination rip and cross-cut saw
- One 24-in. wood planing machine
- One 50-in. x 6-in. grindstone
- One wet tool grinding machine
- One double head punching and shearing machine with 36-throat, to cut 1 in. x 8 in., 2-in. round, and to punch ¾-in. into 1-in. plate, machine to be equipped with cranes.
- One No. 5 bending rolls
- One 2500-lb. double housing hammer, or a press of sufficient size to do similar work
- One 4-in. x 10-in. standard pipe machine
- One dry sandstone, 60 in. x 6 or 8 in.
- One 25-in. motor-driven back geared heavy-duty engine lathe
- One 10-in. belt-driven speed lathe
- One 34-in. motor-driven banding lathe
- One 18-in. x 3-in. motor-driven dry grinding machine with slip motor
- One 24-in. vertical belt-driven radial drill press
- One 14-in. belt-driven single-spindle sensitive drill press
- One 16-in. motor-driven shaping machine
- One 20-in. belt-driven metal band-saw

The heavy demand for automobile tires during the last few months has resulted in plant extensions by practically all the Akron, Ohio, rubber companies. The cost of extensions under way or soon to be started will amount close to \$2,000,000 for buildings alone, exclusive of equipment. The latest company to announce extensions is the Miller Tire & Rubber Company, which will erect a six-story building, 109 x 154 ft., and a one-story and basement building, 40 x 57 ft. The Firestone Tire & Rubber Company has just taken out permits for five buildings, three to be 60 x 125 ft., four stories, and two to be 40 x 125 ft., one story.

It is announced that further large extensions will be made shortly to the plant of the Willys-Overland Company, Toledo, Ohio. A building 400 x 400 ft., five stories, will be erected for final testing, body assembling and finishing. Extensions will be made to the enameling shop, pattern shop and dry building.

The United States Malleable Iron Company, Toledo, Ohio, has increased its capital stock from \$150,000 to \$250,000 to provide for plant extensions and additional working capital.

The Cleveland Wire Spring Company, Cleveland, will enlarge its plant by the addition of another story to one of its buildings, increasing its floor space about 45,000 sq. ft.

The Taylor & Boggis Foundry Company, Cleveland, has increased its capital stock from \$150,000 to \$200,000.

The Cleveland Horseless Farm Machinery Company, Cleveland, has been incorporated with a capital stock of \$35,000 by Oliver W. Johnson, J. H. Hoskell, M. J. Doolittle and others.

The Murray Spring Tire Company Cleveland, has been incorporated with a capital stock of \$50,000 by H. W. Sisson, F. M. Ossman, John M. Wilson and others.

The board of education, Cleveland, will receive bids Aug. 2 for a heating boiler for the East Technical High School.

The Ironwood Mfg. Company, Bellefontaine, Ohio, maker of farm implements, has acquired the Hooker mill property in that city, to which an extension is now being built and which will provide the company with a large increase in space. J. S. Kauffman is proprietor.

The Security Metallic Grave Vault Company, Orrville, Ohio, recently organized with a capital stock of \$200,000, has elected as president D. C. Boyd, president and general manager of the Gallion Iron Works & Mfg. Company, Gallion, Ohio. F. L. Strauss is vice-president; D. F. Griffith, secretary, and H. D. Shannon, treasurer.

A new company is being organized in Sebring, Ohio, with capital stock of \$200,000 to manufacture automobile tires.

The Griffith & Wedge Company, Zanesville, Ohio, maker of engines and boilers, is planning to discontinue business and has offered its plant for sale. The company has been in business since 1840. C. D. Wedge, the president, will devote his attention to other interests.

The Elyria Machine Company, Elyria, Ohio, has been incorporated with a capital stock of \$100,000 by R. A. Green, Thomas R. Bird, E. A. Peters, E. N. Conrad and C. Dewitt.

## Detroit

DETROIT, MICH., July 26, 1915.

The demand for machine tools continues quite active not only in Detroit and its immediate vicinity but in up-State manufacturing centers as well. The automobile and accessory industry is perhaps the heaviest single purchaser with miscellaneous purchases from other manufacturers in metal-working lines. Wood-working machinery is in rather light request. The second-hand machinery market exhibits considerable activity. The foundry situation shows no change. Less work is reported in building circles, and the volume of construction is considerably less than at the same time last year.

The Gomer Oil Company, Detroit, manufacturer of lubricating oils, is preparing plans for a large refinery and manufacturing plant to be erected at Fifteenth Street and the Michigan Central Railroad.

The Charcoal Iron Company of America, Detroit, successor to the Lake Superior Iron & Chemical Company, is making extensive improvements to its Manistique, Mich., plant, including the erection of an oven house, 55 x 268 ft., one story, and a stillhouse, 55 x 90 ft.

The South Park Machine & Supply Company, Port Huron, Mich., has been incorporated by G. F. Connor, E. D. Vanness and E. L. Moak to take over the business of the South Park Mfg. Company. It will manufacture a line of brass goods and will also operate a brass foundry and a general machine shop.

John King, Kalamazoo, Mich., has completed the organization of the Rex Paper Company, a corporation of \$300,000 capital stock of which he is the president. Plans are now being prepared for a plant.

The addition to the plant of the Jackson-Church-Wilcox Company, Saginaw, Mich., manufacturer of automobile steering gears, will consist of a stock, receiving and shipping department, 60 x 200 ft., and a carbonizing and heat-treating department 38 x 70 ft., two stories. It is reported that the company's output for the year ending July 31, 1915, will be about 100,000 gears. It is now employing 200 men in two shifts, but will run only day shifts after the additions are completed.

The Piston Ring Company, Muskegon, Mich., has purchased additional property adjoining its plant. It has recently added a story to its machine shop and does not contemplate any further building operations for the present. Paul R. Beardsley is secretary and treasurer.

The Timken-Detroit Axle Company, Detroit, Mich., is erecting a one-story brick and steel plant on Clark Avenue and Fort Street, at a cost of \$60,000. It is in addition to



its present plant and will double the company's production of truck axles.

The Farmers Auto & Machinery Company, Bay City, Mich., has been organized with a capital stock of \$50,000.

The National Spring & Wire Company, Albion, Mich., will double its capacity by the erection of two additions to its plant, one of which is nearly completed. The total cost of the two additions will be approximately \$40,000.

The Nichols & Shepard Company, Battle Creek, Mich., builder of threshing machinery, will add an addition to its foundry at the end of the present season. With this added space, a new loading track and a large loading crane, the company expects to improve its shipping facilities 25 per cent.

The United Garage & Machine Company, Kalamazoo, Mich., has been incorporated with a capital of \$6,000.

The Grand Trunk Railway System, Merchants Loan & Trust Building, Chicago, will erect a new roundhouse at Bay City, Mich., to cost about \$3,000.

Work has been started on the new three-story concrete and steel addition to the plant of the Detroit Fuse & Mfg. Company, Detroit, Mich., estimated to cost about \$60,000.

The Morton Mfg. Company, Muskegon, Mich., has taken an order for 100 lathes and has been in the market for a variety of machinery equipment. Heretofore this company has specialized in the manufacture of shapers.

The Novo Engine Company, Lansing, Mich., is building an addition to its plant, 60 x 200 ft., one and two stories.

## Milwaukee

MILWAUKEE, WIS., July 26, 1915.

The metal-working trades show a gratifying improvement and a great revival has undoubtedly set in. It appears to be of a permanent nature. Machine-tool builders are too busy to talk, and hardly know how to meet the extraordinary demand. Reports from all parts of Wisconsin are of the most promising character. For the first time in many months there is activity in plant extension and new construction. It is an almost undivided opinion that the situation is the best in more than two years. It is encouraging to note that operations are actually restricted, due to the conservatism of shops, which intend to wait and determine if the present revival is sound enough to warrant extension of facilities. If all the business offered to them were accepted, present facilities would never accommodate it. The improved demand for prime movers and heavy machinery of all types appears to form the accepted basis of belief that the improvement is sound and will be maintained.

Heirs of the late John Thompson, Beloit, Wis., who founded the J. Thompson's Sons Mfg. Company, which retired from business about two years ago, have organized a new company with a capital stock of \$25,000 to engage in a similar line of manufacturing, under the corporate style of the Thompson Plow & Engine Company. The incorporators are O. T., Cora C., Cora A., and A. S. Thompson. It is intended to engage in active business immediately.

The Gas Power Engineering Company, Second Street and North Avenue, Milwaukee, will add a third story, 50 x 150 ft., to its machine shop and garage. Klug & Smith, consulting engineers, are in charge.

The Wisconsin Gas & Electric Company, Racine, Wis., has increased its capital stock from \$2,000,000 to \$2,750,000 to accommodate the natural growth and extension of its business.

Bids close Aug. 7 for the erection of the superstructure of a 2,500,000-bu. grain elevator for the Chicago & North-Western Railway at Milwaukee. It will be of reinforced concrete and cost \$500,000. W. H. Finley, Chicago, is the chief engineer.

Edward Wittwer & Bro., wholesale cheese dealers, Monticello, Wis., are preparing to erect a cold storage plant, four-stories, 50 x 100 ft., with steam power and refrigerating equipment, to cost \$30,000.

The American Skein & Foundry Company, Racine, Wis., is building a foundry addition to cost \$10,000.

The Madison Gas & Electric Company, Madison, Wis., is expending \$15,000 to \$20,000 in the erection of a brick powerhouse.

John Gumb is building a garage and repair shop at Teutonia Avenue and Alten Street, Milwaukee, to cost \$12,000.

The Carl Gross Company, Milwaukee, has been organized to manufacture church furniture and other high-class hardwood material.

The creditors of the defunct Wisconsin Engine Company, Corliss, Wis., will meet Aug. 4 at Milwaukee to consider declaration of a third dividend and for allowance of the receiver's final report. It is reported that the E. L. Essley Ma-

chinery Company, Chicago, has purchased much of the equipment to supply requirements from concerns engaged in the production of war munitions.

The Line Material Works, manufacturer of outdoor electrical material, South Milwaukee, Wis., is continuing the day and night schedule of operations instituted in June during July and August. It is experiencing the busiest season in its history.

The Stowell Mfg. & Foundry Company, South Milwaukee, Wis., which reopened its gray-iron foundry a short time after being practically closed down since last fall, is experiencing a revival in the demand for malleable castings, and this department will be reopened during the current season, furnishing employment for 75 to 100 additional men.

It is understood that the George W. Jagers Mfg. Company, Racine, Wis., gasoline engines and automobile motors, is being reorganized and new capital introduced. The plant closed down several weeks ago and overtures are being made by creditors to accept a part cash, note and stock settlement of the indebtedness, so that operations may be resumed at once and numerous contracts fulfilled. The company was organized early in 1914 and practically its entire output of motors was contracted for by the Argo Motor Car Company, Jackson, Mich. Lack of working capital is said to be the reason for the temporary embarrassment.

Woodmansee & Davidson, consulting engineers, Milwaukee and Chicago, have been commissioned to draw plans for an addition, 75 x 100 ft., to the steam power plant of the Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis. E. J. Ellis, 780 College Avenue, Appleton, is general manager.

F. W. Andree, architect, 77 Cawker Building, Milwaukee, is preparing plans for a garage and repair shop, 55 x 125 ft., one and two stories and basement, to be erected at Dorn Avenue, near Bellevue Place, Milwaukee. The owner's name is withheld.

The Badger Malleable & Mfg. Company, South Milwaukee, Wis., added about 50 workmen to the payroll last week because of increased specifications. The plans has been working at low ebb for several months and early in July went full time. The demand for both gray-iron and malleable castings is reported excellent and getting better.

The Cluley Multiplier Company, of which Iver J. Teague, Green Bay, Wis., is treasurer, has completed arrangements for locating in that city and equipping a plant for the manufacture of a calculating machine.

The Gisholt Machine Company, Madison, Wis., has purchased block 185 in Madison, bounded by East Wilson, South Few, Railroad and South Ingersoll Streets, for about \$15,000, the company exercising an option which it has held on the property for the last six years.

## Indianapolis

INDIANAPOLIS, IND., July 26, 1915.

The Hert Mfg. Company, Indianapolis, has been incorporated with \$15,000 capital stock to manufacture air pumps and automobile specialties. The directors are H. J. Hart, W. A. Rockenfield and J. G. Forster.

The Aetna Trust & Savings Company has been appointed temporary receiver of the Standard Tool & Mfg. Company, Indianapolis.

The Gerlach-Coffield Tinning & Furnace Company, Indianapolis, has been incorporated with \$10,000 capital stock by A. W. Gerlach, John V. Coffield and W. F. Bailey.

Finley Mount, Indianapolis, receiver of the M. Rumschlag Company, announces that the plant at Richmond, Ind., will be sold.

The Hartig-Decker Plow Company, Evansville, Ind., has changed its name to the William F. Hartig Plow Company.

The Howard Shipyard Company, Jeffersonville, Ind., has begun to build an all-steel barge of new type, the first of a fleet of eight designed for the Lakes-to-the-Gulf route. It is 240 ft. long, 42 ft. beam, and will be fitted with a powerful gas engine.

The Hercules Gate Company, Greencastle, Ind., has been dissolved.

The Remy Electric Company, Anderson, Ind., manufacturer of automobile parts, has let the contract for two new buildings for its plant. When these are completed, in thirty days, the working force will be increased by 400.

Ed. Frisz & Co., Inc., Vincennes, Ind., has been incorporated with \$25,000 capital stock to operate a machine and repair shop. The directors are Ed. Frisz, M. M. Frisz and D. C. Boggs.

The Garyson Tool & Mfg. Company, Inc., has just purchased a shaper, milling machine, lathe and drill press to augment its present equipment.

## Cincinnati

CINCINNATI, OHIO, July 26, 1915.

While all local machine-tool builders are very busy, many of them having orders on hand to run their plants for some time in the future, as a rule they are proceeding very cautiously in making any factory additions. It is realized that the present demand for machines cannot continue indefinitely, and manufacturers are loath to make extensions, owing up overhead expenses that might be embarrassing later on. There does not seem to be any foundation for the reports circulated indicating that the long-expected railroad buying would commence soon. A few lists are out and a number of tools have been bought lately, but there is no general demand from that source, and makers doubtless would welcome a further postponement until after the present rush is over. Some domestic business from the automobile and auto-truck builders has been filtering in lately.

The boiler and tank business shows some improvement, and makers of small electric tools are also more optimistic. Foundries making a specialty of machine tool castings are very busy, and it is rumored that extensions are planned by at least one local firm. Another small advance was made in tool-steel prices last week, and business is good with all agencies. It is reported that additional war orders have been taken by several Dayton firms, but confirmation is lacking at this writing.

The Cisco Machine Tool Company, Cincinnati, closely allied with the Cincinnati Iron & Steel Company, has acquired the plant of the Von Wyck Machine Tool Company, manufacturer of engines and turret lathes, in Cumminsville, and will operate it in building Cisco lathes. Plans have been made for increasing the capacity of the new plant, and machinery yet to be bought includes a milling machine, a turret lathe and a planer. The officers of the company are as follows: President, H. C. Busch; vice-president, James I. Stephenson; secretary and treasurer, James A. Sebastiani; general manager, G. Mil. Horton.

It is unofficially reported that the George Roller Bearing Company, Rentschler Building, Hamilton, Ohio, has taken over the vacant plant of the Ideal Steel Wheel Company, Winton Place, Cincinnati, and will fit it up for the manufacture of roller bearings.

Some of the builders of machine tools in Cincinnati who are at the present time having an unusual volume of business have arranged to give the employees a special bonus of ten per cent, to continue as long as the present demand for their product exists. However, quite a number of manufacturing plants in Cincinnati are not operating up to normal capacity.

The Luxury Shock Absorber Company, 128 Opera Place, Cincinnati, has been incorporated with \$50,000 capital stock by Morris Herzog and others. It will make a specialty of a patented shock absorber, and will have it manufactured under contract for the present.

Plans for the rolling mill of the Tubular Steel Products Company, to be erected at Reading, Ohio, are being prepared by E. D. F. Nesbit, architect, First National Bank Building, Pittsburgh, Pa.

Rumors have been circulated through the daily press that Fairbanks, Morse & Co. have acquired a number of machine tool plants in this vicinity. This has been officially denied, the rumors doubtless gaining credence on account of agency arrangements made with different companies.

The Hamilton Machine Tool Company, Hamilton, Ohio, is understood to have received a large order for lathes to be shipped to France.

The plant of the Webster & Perks Tool Company, Springfield, Ohio, which was recently acquired by Toledo, Ohio, interests, will be moved to the fifth floor of the Shuey Power Building. The entire floor has been leased.

The Chair & Table Company, Washington Courthouse, Ohio, is making an addition to its plant, for which woodworking equipment will be required.

## Birmingham

BIRMINGHAM, ALA., July 26, 1915.

The prospect of business is better than it has been since the start of the depression. Gasoline engines are in strong demand, especially for agricultural use, and electrical equipment for mines is selling regularly. The demand for machine tools is better, but they are difficult to secure; factories reporting as much as six months behind on orders. The saw mill demand is negligible. General conditions have improved all around.

The Tennessee-Alabama Lumber Company, Pulaski, Tenn., incorporated with a capital stock of \$5,000, has purchased several thousand acres of timber in Franklin County,

Ala., and will manufacture hardwood lumber. W. W. Ransom, Pulaski, is president.

The Winfield Lumber Company, Gadsden, Ala., has purchased 5,000,000 ft. of pine timber near Springville, Ala., and will manufacture lumber.

The Henderson Lumber Company, Ocilla, Ga., will establish a sawmill in Clinch County, Ga., at a cost of about \$125,000 on a tract of 20,000 acres of timber lands recently purchased.

The Pine Burr Lumber Company, Savannah, Ga., has been incorporated with a capital stock of \$500,000 and has purchased 150,000 acres of timber lands around St. Andrews Bay, Fla., where it will operate, as well as in Georgia. Philip N. Coleman, Savannah, is president.

Bascom Parker is president of a company with \$2,000,000 capital stock, which has taken over the nearly completed mill, 150,000 acres of timber land, railroad, etc., of the Florida Lumber Products Company, Pensacola, Fla. It will complete the mill and operate.

G. Harry Peacock, Selma, Ala., is in the market for an engine lathe, 10 or 12-ft. centers, 20 to 24-in. swing; a 20-in. drill press; a small shaper; a 50-hp. steam engine and a 60-hp. horizontal tubular boiler; sawmill and planer. Most of the equipment is to be secondhand.

The Montgomery Coal Washing & Mfg. Company, Birmingham, Ala., will buy a single-end punch, motor-driven. It is to be used for punching 6-in. holes in  $\frac{3}{8}$ -in. plate. Second-hand equipment will be considered.

## The Central South

LOUISVILLE, KY., July 26, 1915.

Machinery manufacturers admit that conditions are now so much better than heretofore that a genuine optimism is warranted. Plants are operating on a full-time basis, after having been content with reduced forces and short hours for nearly a year. Not only are machine shops busy, but in the foundries and boiler shops the same state of activity prevails. Current business is satisfactory and prospects are excellent. This applies not only to boilers and other power equipment, but to special machinery. Ice machines, which are rather unseasonable just now, continue to sell well, in spite of this. Machine tools, largely for export, continue in good demand. Wood-working equipment is also selling well.

The James Clark, Jr., Electric Company, Louisville, has begun the erection of a warehouse to be used for the storage of iron, etc.

The North Vernon Lumber Company, Louisville, states that the reported improvements at North Vernon, Ind., call for a new power plant, with a 150-hp. boiler, an engine, a 100-kw. generator and a corresponding horsepower in electric motors.

The Middlesboro Electric & Auto Works, Middlesboro, Ky., have been incorporated with \$5,000 capital stock by W. H. Squires, C. B. Finley and J. L. Manning.

The Kentucky River Power Company, Hazard, Ky., is being organized to build a power plant to cost \$350,000. It will serve coal mines within a radius of 25 miles. R. D. Baker is now completing arrangements for the organization of the company. The central station will be of reinforced concrete and steel construction. A turbo-generator unit will be installed, with condensers, automatic stokers, ash-handling equipment, etc. It is planned to take over the power plant of the East Tennessee Coal Company at Hazard and use it as a nucleus for the new plant. H. N. Eavenson and Edward O'Toole, Gary, W. Va., are mentioned as associated capitalists. Actual construction work will be in charge of R. L. Cornell, Hazard.

The Memphis Union Storage Company, Memphis, Tenn., will build a cord storage warehouse.

Marr & Holman, Nashville, Tenn., will probably be architects for the new assembling plant to be erected in that city by the Ford Motor Company, Detroit. The building will be of reinforced concrete construction and will cost several hundred thousand dollars. The equipment will be sufficient to take care of a production of 15,000 cars a year. The machinery will be purchased from the Detroit office.

The William J. Oliver Company, Knoxville, Tenn., has been given a contract for the manufacture of 6-in. shells, complete, for the British Government, and will purchase additional machinery for its plant.

The Continental Piston-Ring Company, Memphis, Tenn., will be in the market for soft gray-iron castings and other material. It will install automatic machinery, individually motor-driven. B. H. Mason is president and in charge of purchases.

The Knoxville, Tenn., Acetylene Company has been incorporated with \$15,000 capital stock and will equip a plant

for the manufacture of an acetylene generator. Charles W. Holm, E. C. Camp and others are stockholders.

The Finkbine Lumber Company, Wiggins, Miss., will develop a large tract of long-leaf yellow pine near D'Lo, Miss. The contract for the construction and equipment of the plant has been let to the Sawmill Construction Company, Savannah, Ga. Specifications include four main sawmill units; a 250-ft. sawmill building, steel and concrete construction; a planing mill, 120 x 144 ft., of steel construction; steel lumber assorter, 600 ft. long; motor-driven machine shop, for repairing logging and sawmill equipment, of steel construction; boiler, engine and fuel house, etc. The equipment for the power plant will include four 500-hp. boilers, a 200-hp. open feed water heater, an open burner for fuel, a 2000-kw. high-pressure condensing steam turbine and alternator, an auxiliary set of 125-kw. engine-type generator, direct-connected to engine, a pumping plant, etc. The entire plant will cost about \$350,000.

## St. Louis

ST. LOUIS, Mo., July 26, 1915.

A steady betterment of feeling is reported among machine-tool dealers here, and while business has shown no exceptional improvement, it has increased sufficiently to indicate that the long looked-for improvement in this territory is about to begin. It continues difficult to obtain equipment of certain classes because of the sharp demand in other territories for machines for the manufacture of war equipment; but demand on that score in this territory is, as it has been, rather light. The St. Louis territory for the most part at least, industrially speaking, has been dependent upon general improvement of business rather than war demand and in consequence has not progressed as rapidly as elsewhere. Inquiries are still for single tools and small lists are tentatively appearing.

The National Enameling & Stamping Company, St. Louis, will add a rolling mill to its Granite City plant with capacity for 50-in. plates.

The Westcott Motor Company, St. Louis, has been incorporated with a capital stock of \$16,000 by Charles P. and T. C. Brandle and H. P. Siegel.

The American Water Rectifying Company, St. Louis, has been incorporated with a capital stock of \$25,000 by Jay M. Goldman, H. C. Stifel and K. N. Matthews.

The Cooke-Stubinger Hotel Kitchen Equipment Company, St. Louis, has been incorporated with a capital stock of \$10,000 by H. V. P. Cooke, John M. Shepherd and William F. Stubinger to manufacture ranges and hotel and kitchen equipment.

The Gravois Foundry & Mfg. Company, St. Louis, has been incorporated with a capital stock of \$35,000 by Isaac Jones, Jacob Straka and Thomas C. Gundelfinger.

The Keytesville Electric Light & Power Company, Keytesville, Mo., of which R. W. Cropper is manager, will install a generating plant, including a 30-kw., three-phase, sixty-cycle, 2300-volt generator, gas engine driven. Henrici, Kent & Lowry, Kansas City, Mo., are the consulting engineers.

The Maryville Electric Light & Power Company, Maryville, Mo., will increase its generating and distributing capacity.

The City Light & Traction Company, Sedalia, Mo., is reported in the market for one 200-kw., two-phase rotary converter and other electric equipment.

The Plymouth Smelting Company, Sarcoux, Mo., will install improvements, including five boilers, one 350-ton mill, a blacksmith shop, etc., at a total estimated cost of \$40,000.

The Norris Grain Company, Kansas City, Mo., will equip a grain elevator to cost complete about \$200,000.

The Springfield Harness Company, Springfield, Mo., has been incorporated with a capital stock of \$25,000 by M. L. Brownloe, R. M. Gadd and W. B. Bairman.

The Coffman Handle Factory, Coffman, Mo., of which K. A. and T. T. Brumbach are the owners, will establish a plant at Cape Girardeau, Mo., for the manufacture of handles, novelty furniture, etc., and is in the market for wood-working equipment.

The ice plant and box factory of Morris & Co., St. Joseph, Mo., has been burned with a loss of \$25,000.

The Rison Gin Company, Rison, Ark., will install four gin stands with a daily capacity of 50 bales.

The Crystal Ice Company, Paragould, Ark., will install electric light and power generating equipment for public service.

The Walbert Stave Company, Peach Orchard, Ark., has been incorporated with a capital stock of \$15,000 by T. J. Walbert, William Johnson and W. W. Walbert.

A. C. Veach, Gravette, Ark., has plans for the construction and equipment of an electric interurban line with power

house, etc., between Melbourne, Ark., and some point on the Iron Mountain Railroad.

The Mangum Cotton Oil Mill Company, Mangum, Okla., has been incorporated with a capital stock of \$50,000 by C. Van Valkenburgh, B. P. Siddons and R. K. Wootten, Jr.

The Checotah Glass Mfg. Company, Checotah, Okla., has been incorporated with a capital stock of \$60,000 by John F. Weaver, H. H. Howard and A. C. Weaver.

The Barlow Chemical Company, Shawnee, Okla., has been incorporated with a capital stock of \$50,000 by J. H. Barlow, Charles Elliott and U. S. Hart.

The Bartlett-Collins Glass Company, Sapulpa, Okla., has been incorporated with a capital stock of \$150,000 by H. U. Bartlett, George F. Collins and E. B. Rankin.

An ice-cream factory with equipment to cost about \$60,000 will be established at Tulsa, Okla., by Clyde G. Aid, Topeka, Kan.

The Gilchrist-Fordney Lumber Company, Laurel, Miss., will equip a logging railroad and is reported in the market for light locomotives, etc.

A packing plant with equipment to cost about \$50,000 is to be established by Walter Godchaux, George S. Guion and Emil Sundberry, Napoleonville, La.

The cold storage plant of the National Fish, Game, Produce & Ice Company, Audubon Building, New Orleans, La., to be equipped at Arabi will involve about \$250,000 of equipment and will have a total capacity of 1750 tons. The bids for ice-making and cold storage machinery will be opened Sept. 1. Ralph W. Lees, Natchez, Miss., is construction engineer in charge of plant.

The Sewerage and Water Board, New Orleans, La., of which F. S. Shields is secretary, is receiving until Aug. 3 bids for a 15-ton traveling crane for pumping station No. 2.

## Texas

AUSTIN, TEXAS, July 24, 1915.

Good rains have added to the already bright prospects for splendid fall crops. Trade conditions generally are better than a year ago. The demand for small tools is specially good. An unusually large number of inquiries for irrigation machinery leads to the conclusion that heavy sales of this class of equipment will be made in the fall.

Charles Gaebler, Brackettville, who is building a water storage reservoir of 9,800,000 gal. capacity, will install an irrigation pumping plant.

Citizens of Fredericksburg plan to build a cottonseed oil mill to cost about \$40,000. S. J. Johnson, Fredericksburg, is in charge.

The Corpus Christi Fraction Company, Corpus Christi, has been organized to construct and operate interurban electric railways. It has a capital stock of \$100,000. Plans include a power plant. Arthur McEvoy, of New York City, is one of the incorporators.

E. B. Coopwood, Lockhart, is president of a company being organized to construct an electric light plant and waterworks at that place to cost about \$100,000.

The Diamond Brick Company, Ferris, will build a brick plant at Mexia.

The Board of Trade, Texarkana, Ark., has closed negotiations for the construction of a plant for the manufacture of store fixtures and refrigerators.

## The Pacific Northwest

SEATTLE, WASH., July 20, 1915.

The transpacific shipping from Puget Sound ports, particularly from Seattle to Vladivostok, is increasing at an astonishing rate. Railroad equipment amounting to 30,000 tons must be moved to Vladivostok in September and October. This is only a comparatively small portion of the tremendous movement of Transpacific war commerce. Foreign lumber exports from Puget Sound have improved greatly since January. The rapid recovery now hinges upon the availability of shipping tonnage. The foreign demand is great. About 300,000 ft. of lumber is now lying on Seattle docks to be shipped to England.

Machinery men and manufacturers are optimistic over general trade conditions. Business has increased considerably for 1915, as compared with 1914. The Lister Mfg. Company, Tacoma, manufacturer of wood products, reports that its business has been 20 per cent better for the first six months of 1915 than it was in the same period for 1914. While prices are not high, the demand is extremely encouraging.

The Broderick & Bascom Rope Company, St. Louis, Mo., announces the extension of its Seattle plant, 85 x 150 ft., involving an expenditure of \$40,000.



The Rutledge Timber Company, Spokane, Wash., will erect a two-banded sawmill in Coeur D'Alene, Idaho, with a capacity of 40,000,000 to 50,000,000 ft. per year. Wyerhaeuser and Huntington Taylor, Cloquet, Minn., are the two principal stockholders.

The Friddle Motor Car Company, Tacoma, Wash., has purchased a site and will construct a plant to cost \$50,000. The company is capitalized at \$1,500,000. James A. Friddle is president.

Sprague, Wash., is considering installing an electric pumping plant, including a 25-hp. motor and pump of 300 gal. per min. capacity.

The Autogenous Welding & Machine Company, Hoquiam, Wash., has been incorporated with a capital stock of \$5,000 by Charles H. Jennings, Howard H. Curry, Warren Dutton, Frank M. Pabst. It will establish shops in this city.

The Pacific-American Fisheries Company, Bellingham, Wash., will build a machine shop 80 x 300 ft., one and one-half stories, at Harris and Fifth Avenues. Plans are practically completed. E. B. Deming is president.

The plant of the Idaho Falls Brewing Company, Idaho Falls, Idaho, will be changed into a cold storage and ice-making plant. Robert W. Keiwert is the proprietor.

The Kootenai Box & Mfg. Company, Spirit Lake, Idaho, has been incorporated and will erect a box shoo factory. The company is incorporated by W. B. Hill, H. R. Schenker and F. W. Lewis.

## Canada

TORONTO, ONT., July 26, 1915.

Members of the Dominion Cabinet have conferred with the shell committee in regard to the supply of zinc for the manufacture of shells. Canada produces large quantities of zinc ore, but the refining is mostly done in the United States. With the demand created by the manufacture of shells, the price of zinc has risen rapidly. Canada will need more and more of this metal as she engages in the making of munitions and steps will be taken to encourage zinc refining in this country.

Work will be started at once on the construction of an addition to the factory of the Whitman & Barnes Mfg. Company, St. Catharines, Ont., manufacturer of tools. The new structure will enlarge the forge room to double its size.

The McKinnon Dash & Metal Works, St. Catharines, Ont., will start the construction of an addition.

The Canadian Pacific Railway is increasing its shell-making facilities at Calgary, Alberta.

The Miramichi pulp mill at Chatham, N. B., of the Dominion Pulp Company, was destroyed by fire with a loss of \$20,000.

The Canadian Cartridge Company, Hamilton, Ont., will spend \$150,000 on machinery to be installed in its plant which is being erected at Hamilton, Ont. A main building, to cost \$30,000, and a boiler house and machine shop will be constructed first. The total investment will be \$250,000.

The Canadian Billings & Spencer Company, Ltd., Welland, Ont., will purchase forge and metal-working machinery to cost \$30,000.

Fire did \$1,000 damage to the melting room of the Polard Mfg. Company's foundry, Park Street and Welland Avenue, Niagara Falls, Ont.

The Marconi Wireless Telegraph Company, Louisburg, N. S., will make extensive alterations and additions to its plant.

A large cold storage plant and tin shop will be constructed for the Borden Milk Company, Ingersoll, Ont.

The Rock & Power Machinery Company, 58 Church Street, Toronto, Ont., is in the market for one 10 or 15-ton locomotive crane, 8-wheel, 38 to 40-ft. boom, equipped with clam-shell bucket and one Ontario type boiler.

A pump factory will be erected at Monteith, Ont. John Thompson, Peterborough, Ont., is promoting the company.

David A. Gordon, Ottawa, Ont., has joined local capitalists in the erection of a sugar factory at Aylmer, Que., to cost about \$400,000.

The Products & Invention Development Company, Ltd., Ottawa, Ont., has been incorporated with a capital stock of \$50,000 to manufacture automobiles, engines, tools, etc. The provisional directors are Edward J. Daly, Percy C. Cooper, John F. Neville, and others, all of Ottawa.

The Canadian Ventilator Company, Ltd., Ottawa, Ont., has been incorporated with a capital stock of \$50,000 to manufacture ventilators, weather strips, etc. Arthur Ellis, Robert A. Devine, Howard Murray and others of Ottawa are the incorporators.

The Maritime Norwalk Vault Company, Ltd., Moncton, N. B., has been incorporated with a capital stock of \$50,000 by Archibald W. Oliver, Albert, N. B.; William Murray, George H. Gorbell and others of Moncton, N. B., to manufacture stone and granite.

The Gordon Lumber Company's mill at Cache Bay, near North Bay, Ont., was completely destroyed by fire with all its machinery and equipment. The loss will amount to \$150,000 with \$75,000 insurance. Senator Gordon was the owner of the plant.

The Aetna Explosives Company of Canada, a subsidiary of the Aetna Explosives Company, 2 Rector Street, New York, has been formed with a capital stock of \$750,000, and will commence immediately on the erection of a plant at Drummondville, Que., the first part to be completed in nine weeks. The Canada Car & Foundry Company interests at Montreal will have representation on the board of directors.

Work will be started at once on the construction of an elevator with a capacity of about 1,500,000 bu. to cost \$750,000 for the Harbor Commissioners, Montreal, Que. The elevator is to be finished in 1916.

The Hamilton Facing Mill Company, Ltd., Hamilton, Ont., manufacturer of foundry cars, core ovens, blowers, foundry facings and supplies, etc., has had its capital stock increased from \$25,000 to \$75,000.

The P. Lyall & Sons Construction Company, Ltd., Montreal, Que., has had its charter extended so as to include the following objects and purposes: to manufacture shells and other munitions of war.

The J. F. Howell Company, Ltd., Toronto, Ont., has been incorporated with a capital stock of \$100,000 to manufacture jewelry, watches, etc. The provisional directors are Oscar H. King, 15 Wellington Street, East; E. M. Rowand and others, all of Toronto.

The Architectural Woodworking Company, Ltd., Toronto, Ont., has been incorporated with a capital stock of \$50,000 to manufacture revolving doors, refrigerators, etc. The incorporators are Henry E. Gardner, 27 Ridley Gardens, George A. Williams and others of Toronto.

The Canada Metal Company, 35-53 Fraser Avenue, Toronto, Ont., will build a two-story addition to its factory to cost \$15,000.

Lenoxville, Que., will spend \$40,000 on repairs and extensions to its waterworks plant.

R. C. Bartlett has secured the Morelock factory building at Stratford, Ont., and will install machinery and equipment in the building for the manufacture of automobiles. Mr. Bartlett has been manufacturing automobiles in Toronto, Ont., for some time.

The Berwick Planing Mills, owned by J. W. Hutchison, Berwick, N. S., were destroyed by fire with a loss of \$10,000.

The Truro Engineering Company, Ltd., Truro, N. S., will install \$27,000 worth of machinery in its plant for the manufacture of shells.

Chambly Basin, Que., will install two electric turbine pumps with a capacity of 600,000 and 400,000 gal. per day.

Alfred A. Viau, 7 St. Joseph Street, St. Jerome, Que., is contemplating the erection of a foundry there.

The Town Council, Outremont, Que., is in the market for machinery for penetrating asphalt work. E. T. Sampson is secretary.

Swift Current, Sask., will spend \$75,000 for a new powerhouse which is being constructed there.

The Western Terminal Elevator Company of Winnipeg, Man., has completed plans for a mixing elevator at Fort William, Ont., to cost \$100,000.

Drumheller, Alberta, will receive bids until August 16 for one horizontal return tubular boiler and stack, one duplex pump, etc. The John Galt Engineering Company, Ltd., is the engineer. O. McKee is town secretary.

## Government Purchases

WASHINGTON, D. C., July 26, 1915.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Aug. 24, schedule 8627, for two 8-in. x 40-in. lathes, two 12-in. x 6-ft. lathes, two hand milling bench machines, two vertical milling machines, two 2-spindle drill presses and one 1-spindle short column type drill press, all for Washington.

Sealed proposals will be received by the chief of the Bureau of Yards and Docks, Navy Department, Washington, until 11 a. m., July 31, for furnishing and installing new mechanical stoker equipment in the boiler plant at the New York navy yard, Brooklyn.

The general purchasing officer of the Panama Canal, Washington, will receive sealed proposals until July 30, circular 2026, for furnishing one centrifugal pump.

## NEW TRADE PUBLICATIONS

**Steel Window Sash.**—Trussed Concrete Steel Company, Youngstown, Ohio, Folder. Calls attention to the fire-resisting qualities of the company's steel window sash as evidenced by a test made at the Edison plant after its destruction last winter. A description of the test is given, supplemented by engravings of some of the sash that were tested.

**Shaft Coupling.**—Automatic Shaft Coupling Company, 303 Real Estate Trust Building, Washington, D. C.; Campbell Machinery Company, 5 Beekman Street, New York City, sole selling agent. Pamphlet. Relates to the Bull Dog Grip for couplings, collars and pulley bushings. The special features of the coupling, such as positive grip, perfect alignment, ease of application, full transmission of power and freedom from adjustment are briefly touched upon. Engravings of the collar, which joins shafting without the use of keys, bolts or set screws, are presented, and a sectional view showing the way in which the hold on the shaft is obtained is included. Mention is also made of a pulley bushing operating on the same principle as the coupling.

**Oil and Tar Burning Apparatus.**—W. N. Best, 11 Broadway, New York City. Boiler catalog No. 25. Relates to a line of liquid fuel equipment for burning oil and tar under stationary, locomotive and marine boilers. After illustrations and a brief description of the burner general instructions for operation are presented. The larger portion of the catalog is given over to the application of the burner to boilers of various types, the text being supplemented by numerous line and halftone engravings. Mention is made of the fuel supply system used in connection with the burner and a list of users is included.

**Overhead Trolley Systems.**—Richards-Wilcox Mfg. Company, Aurora, Ill. Catalog. Gives detailed information on a line of overhead trolley and I-beam carrying equipment for handling goods in factories, foundries, machine shops, quarries, warehouses, etc., where heavy loads must be shifted and moved about. There is practically no text in the catalog, engravings of the various parts and actual installations being relied upon to tell the story. In addition to the overhead conveying systems, views of traveling and jib cranes and hoists are presented with tables of different sizes that can be supplied. Mention is also made of a line of fixtures for fire doors.

**Recording Instruments.**—Bristol Company, Waterbury, Conn. Bulletin No. 200. Gives information regarding the exhibit of the company at the Panama-Pacific Exposition. A number of views of the exhibit are presented followed by engravings of the various demonstration units. These include portable and stationary recording pressure gages, long distance recording system; recording thermometers, pyrometers and tachometers, and time and motion recorders. Under each of the engravings a brief description of the apparatus is presented.

**Internal Combustion Engines.**—Bessemer Gas Engine Company, Grove City, Pa. Bulletin OE5. Relates to an oil burning engine which is built in single and twin cylinder styles. The cylinder, to a certain extent, is double-acting, the crank end being used as a pump to supply the air necessary for combustion. The construction of the engine is described at some length, the text being supplemented by views of the engines and some of the different parts. A brief statement of the fuel economy of a 100-hp. engine as compared with steam and gas engines and central station electric power is included.

**Piston Rings.**—Burd High Compression Ring Company, Rockford, Ill. Folder No. 400. Concerned with a line of piston rings for use in internal combustion engines in which the opening in the ring is closed by a metallic guard. The construction and use of these rings is illustrated by a number of halftone engravings. The use of individual castings for the rings is emphasized and the way in which the rings are finished described.

**Boring Mills.**—Gisholt Machine Company, Madison, Wis. Collection of four-page bulletins. Cover various sizes of boring mills that are built ranging from 30 to 72 in., a separate bulletin being devoted to each particular machine. Each of the bulletins contains an engraving of a particular machine with a brief description and table of the principal dimensions. The machines can be arranged for either belt or motor drive, the latter including both direct and alternating current adjustable and constant speed equipment.

**Vertical Air Compressors.**—Gardner Governor Company, Quincy, Ill. Folder GR-3. Mentions a line of air compressors that are made in a number of different sizes ranging from 6 to 140 cu. ft. capacity. Most of the folder is

given over to illustrations of the various types of compressors and their drives. The special features of the construction of the compressor are briefly touched upon and a specification table of the several sizes is included.

**Car Movers.**—Walter A. Zelnicker Supply Company, St. Louis, Mo. Leaflet. Presents illustrations of a double clutch car mover which has a double set of clutching bits that enable it to be used on wet and icy tracks. A special feature of the mover is the use of a compound leverage system.

**Gearing.**—Horsburgh & Scott Company, 5114 Hamilton Avenue, N. E., Cleveland, Ohio. "Blue Book on Gearing." Describes an extensive line of gearing that includes rawhide cut metal; planed bevel, herringbone and spiral gears; racks and worms and worm gears. The rawhide pinions are first taken up and their advantages, construction and application are briefly touched upon followed by a list of the various sizes that can be furnished, the text and tables being supplemented by a number of engravings. Metal gearing is then described with information on the various kinds of gears that can be supplied. Tables of data and rules for finding the various dimensions of the several types of gears are included.

**Centrifugal Pumps.**—Allis-Chalmers Mfg. Company, Milwaukee, Wis. Bulletin No. 1063. Illustrations and descriptive matter explain the operation of a line of centrifugal pumps that are made in a number of different sizes and styles. A brief general description of the double-suction single-stage, horizontal type is presented, the text being supplemented by engravings showing the construction and some of the different driving arrangements that can be supplied. This is followed by specification and dimension tables. The same procedure is employed for the single-suction single stage and the single-suction multi-stage pumps. Mention is made of some of the special types of centrifugal pumps that can be furnished, illustrations of them being presented and instructions for the installation and operation of the pumps are included.

**Electric Grinding Machines.**—Chicago Pneumatic Tool Company, 1010 Fisher Building, Chicago, Ill. Bulletin No. E-36, superseding E-29. Illustrates and describes a line of heavy duty portable electric grinding machines that are especially adapted for use in foundries, machine and structural shops, and for grinding rails on street railways. Other machines include a portable surface, tool post, bench and external and internal grinding machines. The tool post and bench machines are made for use on direct current circuits only, while the others can be supplied for use on either direct or alternating current. Brief specification tables of the various sizes of machines that can be supplied are included.

**Gas Engines.**—C. Benninghofen & Sons, Hamilton, Ohio. Bulletin. Refers to a two-cylinder, four-cycle horizontal gas engine using natural and illuminating gas or gasoline fuel. After a brief description of the engine, the various parts are taken up in detail, the text being supplemented by a number of illustrations. Specification tables of the various sizes of engines are presented and emphasis is laid upon the economy of fuel consumption. Lists of the sizes of shafting to be used with the generators that the engine can drive through a belt connection are included.

**Wood Boring Bits.**—W. A. Ives Mfg. Company, Wallingford, Conn. Circular. Points out in the form of an imaginary talk with the mechanic the various advantages of the bits. Mention is also made of other tools that can be supplied.

**Elevator Controllers and Electric Motors.**—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Folder. The first, No. 2322-C, gives general description and specifications for a single-phase motor for use wherever strong starting effort is required and the only circuit available is that supplying the lights. The second, No. 2382, is devoted to an alternating current motor for operation of small machines where not much attention can be paid to the motor. The other two leaflets, Nos. 3789 and 3790, illustrate and describe full and semi-magnet types of elevator controllers.

**Water Softening.**—Permutit Company, 30 East Fort second Street, New York City. Folder. Points out the advantages of using Permutit for softening water for industrial purposes. Among them are prevention of scale and mud, elimination of boiler defects and tube replacements and a decreased fuel consumption. The material is a soft filtering medium which is insoluble in water and possesses the property of absorbing calcium and magnesium from water passing through it. The filter is automatic in operation and, in addition to removing the scale forming elements from feed water, can be used for removing iron, manganese and other metals as well as organic matter, color, odor and objectionable gases and tastes. Exterior and sectional views of the filter are presented.

